JEFFERSON COUNTY, WISCONSIN
HIGHWAY DEPARTMENT

OPERATIONS REVIEW

INTRODUCTION

In January 2004, Jefferson County retained the services of ***ECLIPSE*** and its subcontractor Virchow Krause & Company LLP to conduct a comprehensive review of the County Highway Department's current operations. The objective of this review is to assess the management, operations, funding, and facilities of the Highway Department including:

- Comparison of the pavement conditions of Jefferson County's road system to comparable Wisconsin counties;
- Review of all Highway Department operations and resources;
- Evaluation of alternative service delivery options (where appropriate);
- Review of the extent to which county taxpayers are subsidizing state or local road construction and maintenance activities;
- Evaluation of Highway Department shop operations and facilities; and
- Analysis of findings contained in the "2002 Highway Lane Mile Comparison Study" prepared by the Jefferson County Clerk's office.

Review Methodology

ECLIPSE and Virchow Krause employed a highly interactive methodology in conducting this review, meeting with Highway Department staff and others throughout the organization. It should be noted that this report focuses on areas that provide the greatest opportunity for improvement and does not address the Department's performance or processes that are fundamentally sound.

The team evaluated practices and performance in each of the areas using a variety of methods, including:

- Interviews with all members of the Highway Department;
- Extensive review of background and other documentary materials on equipment policies, procedures, and practices;
- Analysis and summary of all county highway operations;
- Inspection of maintenance facilities and fleet maintenance practices;
- Interviews and site-visits with eight (8) "peer" counties (Chippewa, Eau Claire, Fond du Lac, Manitowoc, St. Croix, Sheboygan, Washington, and Waupaca), to develop comparable benchmarking information to use as a measurement of best practices;
- Site-visits to eight (8) comparable counties (Calumet, Chippewa, Fond du Lac, Manitowoc, Sauk, Sheboygan, Washington, and Waupaca) to prepare a comparison of pavement conditions using the Wisconsin Information System for

Local Roads (WISLR) system and Pavement Surface Evaluation and Rating System (PASER);
- Survey of eight (8) comparable counties (Calumet, Chippewa, Fond du Lac, Manitowoc, Sauk, Sheboygan, Washington, and Waupaca) to confirm data contained in the "2002 Highway Lane Mile Comparison Study" prepared by the Jefferson County Clerk's office; and
- Survey of all Jefferson County towns, villages and cities.

The team used the information gathered through these methods to evaluate the performance of the Highway Department and to formulate findings and recommendations for improvement and/or additional investigation.

Services Provided by Highway Department

The Jefferson County Highway Department is responsible for maintaining 258 centerline miles of County trunk highways, 154 centerline miles of State trunk highways and 23 centerline miles of interstate highway. The Highway Department also provides various services to numerous local municipalities within and outside Jefferson County.

As part of the maintenance effort for the Highway Department, the following activities constitute core functions:

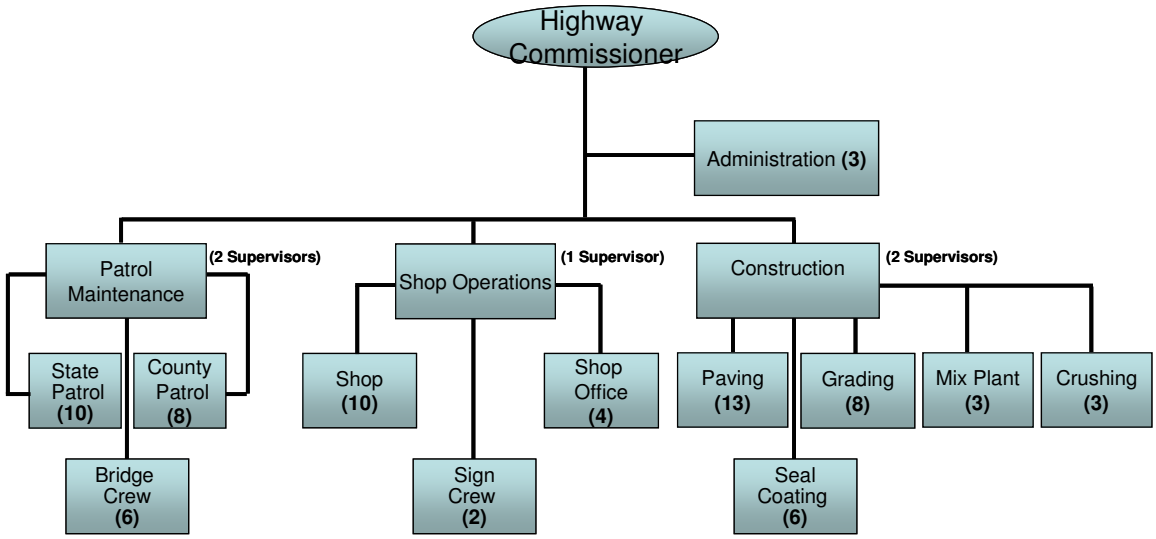
- Snow and Ice Removal
- Fleet Maintenance
- Road Reconstruction and Maintenance
- Right of Way Maintenance
- Crushing operations
- Asphalt Operations
- Culvert Installation and Maintenance
- Traffic Sign Maintenance and Replacement
- Pavement Stripping
- Crack Sealing
- Chip Sealing
- Pavement Maintenance

As of January 2004, the Highway Department was composed of 81 full-time employees, managed by the Highway Commissioner, who reports to the Highway Committee and the County Administrator. The Highway Committee is composed of five elected County Board members who serve on a rotating basis.

The Department's current organization chart (as of January 1, 2004) is shown below.

Comments on the remaining part of the organization and specific recommendations on staffing appear in later parts of the report.

Highway Department operations are primarily conducted from the operations center in Jefferson, with outlying patrol road sheds in several parts of the county. Patrol vehicles and equipment are kept at these sites to reduce travel time to the respective patrol sections.



The following table summarizes the Highway Department's actual expenditures for the past three years.

Jefferson County Highway Department Actual Revenues & Expenditures 2001-2003			
	2001	**2002**	**2003**
REVENUES			
Tax Levy	(3,309,665)	(3,797,776)	(3,778,618)
Grants	(1,939,093)	(1,811,144)	(2,139,412)
State Charges	(1,290,331)	(1,909,599)	(1,783,452)
Municipal Charges	(1,106,879)	(1,113,791)	(1,209,850)
Other Dept. Charges	(117,919)	(443,845)	(324,260)
Other Revenue	(16,824)	(38,161)	(189,962)
Transfers to/(from) Other Funds	(404,711)	20,237	(270,289)
Total Revenues	**(8,185,422)**	**(9,094,080)**	**(9,695,844)**
EXPENDITURES			
Salaries & Fringe Benefits	4,600,375	4,584,034	5,159,509
Committee Expenses	5,895	7,870	9,280
Office Supplies & Expenses	36,559	67,837	36,094
Engineering & Right of Way	23,229	26,683	118,499
Highway Materials & Supplies	2,237,955	2,424,450	3,480,969
Utilities	97,953	84,073	134,483
Depreciation	825,694	837,383	825,479
Insurance	137,774	142,355	165,041
MIS Charges	77,152	61,403	63,545
Local Road Aids	95,281	76,683	82,378
Local Bridge Aids	30,545	33,877	24,857
Total Expenditures	**8,168,413**	**8,346,649**	**10,100,135**
Source: County Financial Records (JD Edwards system).			

Total revenues including the property tax levy and transfers to/from other funds (e.g., general fund, contingency fund) increased 18.5% between 2001 and 2003. Excluding these items, total revenues grew 26.3% during this period. Between 2001 and 2003, the property tax levy for the Highway Department increased 14.2%. In 2004, the Highway Department's property tax levy was budgeted at just over $3.3 million, a 12.7% decrease from 2003.

Salaries and fringe benefits made up more than half of the Highway Department's expenditures between 2001 and 2003, and grew 12.2% during this time. It should be noted, however that the 2003 salaries and fringe benefits included the Highway Department's share of the county's pay off of its unfunded pension liability. If the $241,111 were subtracted from the total, salaries and fringe benefits would have increased 6.9% between 2001 and 2003.

Non-salary and fringe benefits related expenditures ranged from $3.6 million in 2001 to $4.9 million in 2003, a 38.5% increase. Overall, total expenditures for the Highway Department increased 23.6% between 2001 and 2003, from $8.2 million to $10.1 million.

Appendix A includes a breakdown of Highway Department expenditures for 2001 through 2003 by major function.

PEER COUNTY BENCHMARKS

In Wisconsin, geography plays a role in the difference between counties with regard to availability and affordability of services, location of road sheds and the main office, length and number of roadways, functional class of roadways, river crossings and roadway connectivity. Recognizing the role that geography plays within each county, the project team visited eight comparison counties (Chippewa, Eau Claire, Fond du Lac, Manitowoc, St. Croix, Sheboygan, Washington, and Waupaca) to develop benchmark information that could provide an additional level of insight in the review of Jefferson County's Highway Department.

It should be noted that the benchmarking data contained in this report is intended to provide general background findings about the County's highway operations. Care must be taken to avoid conclusions that specific data show positive or negative conditions. The purpose in collecting and analyzing this information is to determine general correlations between workload pressures and staffing requirements.

The peer counties were averaged to generate a peer county benchmark for comparable data values including employees per capita, center-line miles per capita, lane miles per capita, center-line miles per employee, and lane miles per employee. Also of interest is the state and county patrol section length. The table below highlights some of the information collected. The complete results of the benchmarking review can be found in Appendix B.

Jefferson County Highway Department Comparison of Selected Benchmarking Data				
Benchmark	**Jefferson County**	**Peer County Average**	**Jefferson County Rank**	**Jefferson County % Above/(Below)**
Total County Population	74,021	84,193	6 of 9	(12.1%)
Total Land Area (square miles)	557.0	672.6	7 of 9	(17.2%)
Highway Department Employees	81.0	76.8	T4 of 9	5.5%
Highway Department Employees Per Capita	913.8	1,195.4	6 of 9	(23.6%)
Interstate Highway Center-Line Miles [1]	23.0	32.3	5 of 5	(28.8%)
State-trunk Highway Center-line Miles	154.0	178.8	6 of 9	(13.9%)
County-trunk Highway Center-line Miles	258.0	347.3	8 of 9	(25.7%)
Center-line Miles Per Employee [3]	5.4	7.3	8 of 9	(26.0%)
Lane Miles Per Employee [3]	11.5	16.7	9 of 9	(31.1%)
Center-line Miles Per Capita [3]	170.2	165.5	4 of 9	2.8%
Lane Miles Per Capita [3]	79.4	70.7	3 of 9	12.3%
Length of State Highway Sections [2]	415.7	516.4	8 of 9	(19.5%)
Length of County Highway Sections	516.0	724.5	8 of 9	(28.8%)
Number of State Patrol Sections (Snow)	7.5	11.8	9 of 9	(36.4%)
Number of County Patrol Sections (Snow)	8.5	17.1	8 of 9	(50.3%)
Average State Patrol Section	55.4	44.8	3 of 9	23.7%
Average County Patrol Section	60.7	48.1	2 of 9	26.2%

Notes:
[1] Peer average and ranking based only on 4 comparison counties with interstate highways.
[2] Includes interstate highways and state-trunk highways.
[3] Includes interstate highways, state-trunk highways, and county-trunk highways.

As the above information shows, the State and County trunk highway patrol operations in Jefferson County is generally in line or better than the other peer counties. However, when reviewing the total Highway operations, Jefferson County is in the lower rankings for population, land area and center line mileage, while in the highest rankings for employees per capita, center line mileage and lane miles.

ANALYSIS OF 2002 HIGHWAY LANE COMPARISON STUDY

We reviewed the methodology and conclusions of the October 8, 2002 Highway Lane Mile Comparison Study conducted by the Jefferson County Accounting Manager. That study showed that Jefferson County had the third highest property tax levy cost per lane mile of the 43 Wisconsin counties that responded to the survey – behind Sheboygan County (highest) and Kenosha County (second highest).

We used a similar methodology to the 2002 study but applied it to a comparison of the following eight peer counties: Calumet, Chippewa, Fond du Lac, Manitowoc, Sauk, Sheboygan, Washington, and Waupaca – counties having similar populations, adjacency to major urban centers, similar state and interstate routes, etc. In addition, we used a three-year average rather than the five year average of the 2002 study due to data availability restraints.

Our findings essentially confirm the Accounting Manager's 2002 findings with one exception. Kenosha County falls from second highest cost per lane mile ranking to near the bottom. The explanation is associated with the fact that the 2002 analysis categorized Kenosha County highway project bond financing as property tax levy when in fact it should not have.

Our main finding based on our review of the information is that Jefferson County had the second highest property tax levy cost per lane mile, a close second to Sheboygan County, using data for 1998, 2000, and 2002. As the table below shows, Sheboygan County had a levy of $6,696 per lane mile and Jefferson County had a levy of $6,528 per lane mile. Jefferson County is 38.1% above the average levy per county trunk highway lane mile. Notably the peer counties' rankings (with the exception of Kenosha County as explained above) are the same in our findings and the 2002 study.

We also analyzed the ratio of the number of total lane miles (for all state, county, and interstate highways) to the number of full-time highway department employees. The average ratio for the eight peer counties is 18 total lane miles per employee. Jefferson County's ratio is 11.8, and is the second lowest (worst) of the nine counties (Jefferson County plus the eight peer counties).

Jefferson County Highway Department
Summary of Comparable County Property Tax Levy and Full-time Employees per Lane Mile

	Property Tax Levy for Highway Department								
County	1998	2000	2002	3 Year Average	CTH Lane Miles	3 Year Average Levy/CTH Lane mile	Total Lane Miles [1]	Full-time Employees	Lane Mile/Employee
Sheboygan	$ 3,741,141	$ 3,695,671	$ 4,395,086	$ 3,943,966	589	$6,696	1072	120	8.9
Jefferson	$ 3,321,027	$ 3,025,500	$ 3,797,776	$ 3,381,434	518	**$6,528**	964	82	**11.8**
Washington	$ 2,523,000	$ 2,555,862	$ 2,711,154	$ 2,596,672	403	$6,443	954	48	19.9
Calumet	$ 1,476,185	$ 1,472,136	$ 1,298,997	$ 1,415,773	261	$5,424	496	23	21.6
Waupaca	$ 2,795,706	$ 3,135,952	$ 3,298,890	$ 3,076,849	694	$4,434	1153	83	13.9
Manitowoc	$ 2,386,757	$ 2,560,118	$ 2,672,000	$ 2,539,625	577	$4,401	1014	65	15.6
Fond du Lac	$ 2,444,246	$ 2,865,040	$ 3,087,341	$ 2,798,876	719	$3,893	1292	60	21.5
Sauk	$ 2,360,280	$ 2,516,864	$ 2,935,363	$ 2,604,169	673	$3,869	1240	59	21.0
Chippewa	$ 2,472,139	$ 2,600,790	$ 2,655,196	$ 2,576,042	941	$2,738	1502	78	19.3
Average w/o Jefferson County				$ 2,693,996	607	**$4,737**	1090	67	**18**

Notes:
[1] Total lane miles include interstate highway, US highway, state trunk highway, and county trunk highway miles, but excludes city, village, and town lane miles.

Another way to compare the relative costs of the peer counties is to examine the highway department property tax levy as a ratio of the total county property tax levy for all purposes. The table below shows that for 2004, Jefferson County's levy for highway operations is 14.5% of the total county levy, while the average of seven of the eight peer counties (Washington County did not respond to our request for information) was 15.2%. It should be noted that differences in percentages might be partially explained by factors unrelated to highway department costs and levy (e.g., nursing home levies – some counties may have high levies for that purpose and others may have no nursing home or a very small levy).

Jefferson County Highway Department Comparison of Highway Department 2004 Budgeted Expenditures & Property Tax Levy					
County	2004 Highway Expenditures	2004 Highway Levy	2004 Levy % of Expenses	2004 Total Co Levy	Highway % Total Levy
Calumet	$3,095,909	$2,039,454	65.9%	$11,749,516	17.4%
Jefferson	**$7,921,579**	**$3,300,250**	**41.7%**	**$22,701,042**	**14.5%**
Sauk	$7,797,661	$2,975,842	38.2%	$22,163,489	13.4%
Manitowoc	$7,253,248	$2,657,712	36.6%	$25,011,915	10.6%
Chippewa	$9,962,478	$2,979,670	29.9%	$12,007,789	24.8%
Waupaca	$11,447,025	$3,360,767	29.4%	$16,285,270	20.6%
Sheboygan	$12,649,009	$3,493,665	27.6%	$41,052,324	8.5%
Fond du Lac	$14,998,998	$2,851,771	19.0%	$26,279,841	10.9%
Average w/o Jefferson County	$9,600,618	$2,908,412	35.2%	$22,078,592	15.2%

COMPARATIVE ANALYSIS OF COUNTY-TRUNK HIGHWAY ROAD CONDITIONS

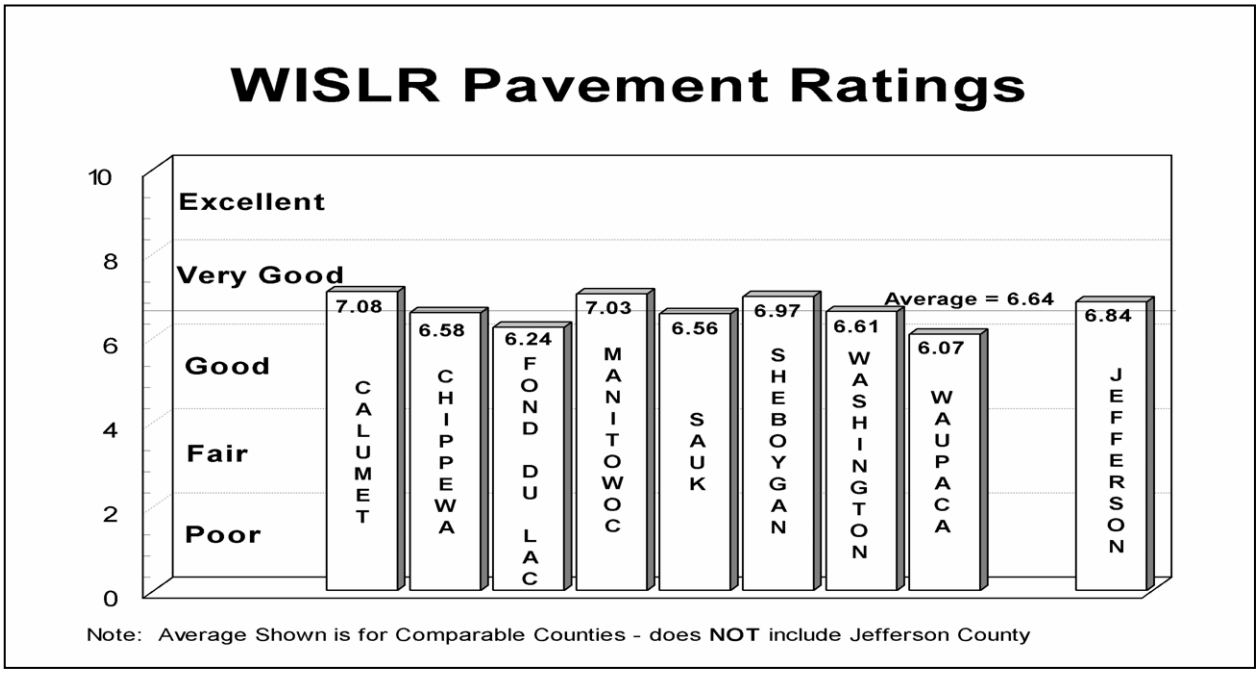
This section of the report analyzes the condition of the Jefferson County Trunk Highway System compared to the conditions of the eight peer counties indicated in the previous section.

To perform this analysis, we carried out the following activities in order to provide a summarized, qualitative assessment of the overall level of service as determined by the condition of the county trunk highway systems of each of the eight peer counties to that of Jefferson County:

- Obtained Jefferson County Highway System segments using Wisconsin Information System for Local Roads (WISLR) data;
- Selected a random sample of roadway segments for Jefferson County and the eight peer counties for comparative analysis;
- Traveled to each of the nine counties to inspect and analyze each of the sample roadway segments for pavement condition using the Pavement Surface Evaluation and Rating System (PASER), documenting pavement conditions; and
- Analyzed each of the roadway segments to evaluate pavement and shoulder widths and conditions.

Summary of Findings

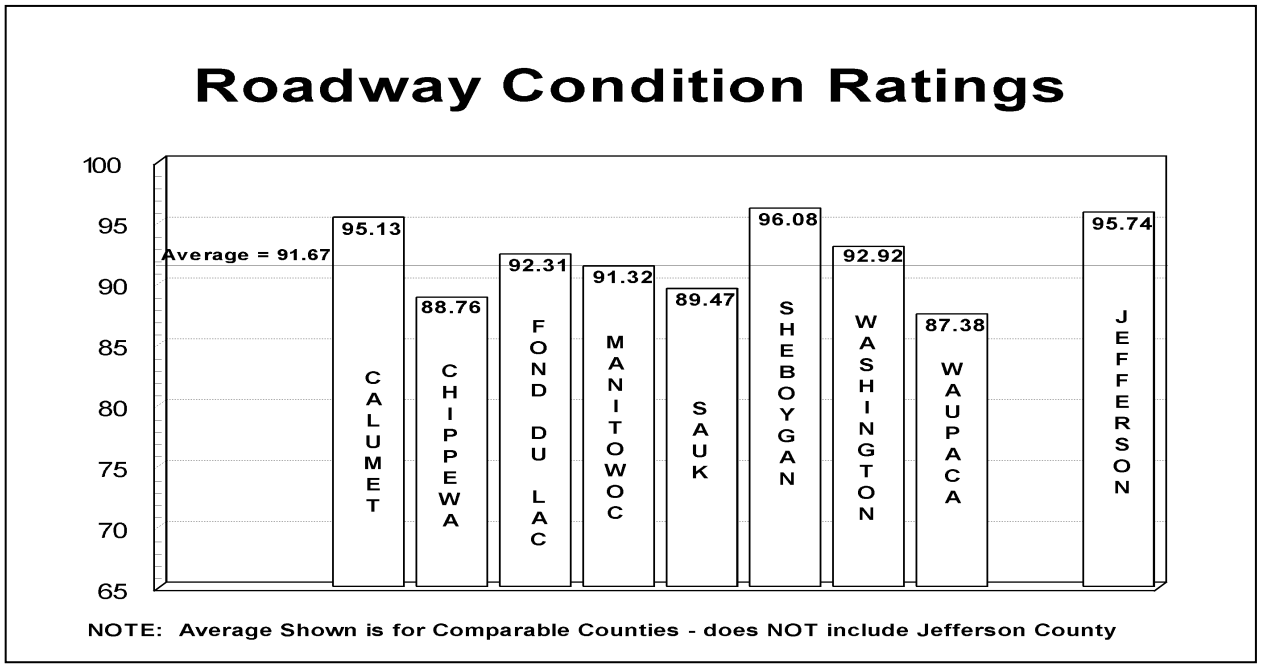
The Jefferson County Trunk Highway System's overall pavement condition ranked fourth highest among the nine counties. All nine of the counties' ratings were in the Very Good category (Excellent: 8-10, Very Good: 6-8, Good: 4-6, Fair: 2-4, and Poor: 0-2) and were somewhat tightly clustered in the range of 6.07 to 7.08). The overall pavement condition of the Jefferson County's highway system equals 6.84 on a scale of zero to ten, with ten indicating newly constructed pavement. This rating was greater than the average of 6.64 for the eight comparable counties. The results of this analysis are shown in the graph below.



The overall condition of the Jefferson County Trunk Highway System ranked second among the nine counties in terms of roadway conditions. Note that pavement condition was **not** included in the roadway condition rating. This rating relied on an analysis of the compliance with pavement and shoulder widths compared to standards along with the conditions of side slopes, drainage, pavement marking, signage, and vegetation maintenance.

The overall condition of the Jefferson County Trunk Highway System equals 95.74 on a scale that ranged from 60 to 100. This rating was greater than the average of 91.67 for the eight comparable counties. Note that the range of ratings is from a high of 96.08 (Sheboygan County, which also had the highest property tax levy per lane mile ranking) to a low of 87.39 (Waupaca County, which had a below average property tax levy per lane mile in the peer county comparison).

The results of the roadway condition ratings are shown graphically in the following chart:



The full report detailing findings of the comparative analysis of the Jefferson County trunk highway system to the eight peer counties can be found in Appendix C.

REVIEW OF OPERATIONS

The primary goal of this study was to provide Jefferson County with an assessment of the Highway Department's operations as it relates to administration, maintenance, construction, and financial reporting. Specifically, the review was intended to evaluate the current resources being applied to accomplish the major functions of the Highway Department. Additionally, the review was expected to provide a general assessment of the ability of the Highway Department to potentially outsource some of its functions if feasible and cost effective.

This section of the report provides a general review of the major functions of the Highway Department, with recommendations to improve upon current services and delivery models. As indicated in the introduction to this report, we are focusing our attention on those areas that appear to provide the greatest opportunity for improvement. We have not taken time to address the Highway Department's performance or processes that are fundamentally sound.

The first step in evaluating the services performed by the Highway Department is to identify its mission and priorities. The mission of the Highway Department is to maintain a safe and efficient transportation system, with the provision of winter maintenance (snow and ice removal) being its number one priority. To better guide the County Board, Highway Committee, Highway Commissioner and staff, and other County officials, we have summarized the Department's activities into three main functional priorities as follows:

1. Winter Maintenance,
2. Roadway Maintenance, and
3. Construction.

Any decision to modify operations, staffing, or organization of the Highway Department must consider these priorities. As important, any decisions to consider outsourcing particular services of the Highway Department must clearly demonstrate how this alternative method of service delivery would support or augment the Department's overall prioritized functional responsibilities.

Winter Maintenance

The Highway Department is responsible for the winter maintenance of both State and County trunk highways and offers contracts to all towns based on a time and material contract basis. The priority with regard to winter maintenance operations is:

1. State Highways,
2. County Roads, and
3. Town roads.

The priority used to determine which County roads are plowed first and/or the level of winter maintenance provided on the county trunk highway system is vested in the authority of the County's elected officials. The State dictates the level of service for winter maintenance for all State highways located within Jefferson County based on the County's contract with the Wisconsin Department of Transportation (WisDOT). Winter maintenance priorities for the state highway system are based on WisDOT's analysis of average daily traffic (ADT) information. ADT is one of the primary criteria for determining a desired level of service on State trunk highways.

The County receives funding from WisDOT based on the level of service required for winter maintenance and the total miles of state highways.

Winter maintenance operations are directed from the main garage in Jefferson and radiate out into the various patrol sections on the state and county highway systems as well as for the towns who contract with the Highway Department for snow removal. The County also operates three satellite shops, Waterloo, Ixonia and Palmyra which cover three state maintenance and two county maintenance sections.

The table below summarizes the Highway Department's expenditures for providing winter maintenance. Over the past three years, the Highway Department's total expenditures for winter maintenance on state, county, and town road systems has steadily grown from just over $627,000 in 2001 to nearly $854,000 in 2002, a 36.1% increase.

Over three-quarters of the increase between 2001 and 2003 was related to services on the county-trunk highway system, where expenditures grew from nearly $270,000 to nearly $451,000 (62.7% increase). Much of this increase in expenses was related to sand/salt materials and the allocations for various cost pool variances within the Highway Department.

On the state highway system, expenses grew 21.9%, from over $210,000 in 2001 to nearly $257,000 in 2003. Much of this increase was in equipment rental rates.

Town winter maintenance activities remained relatively stable during this time, increasing only 4.6%. Much of the increase was a result of higher salary and fringe benefits expenditures.

It should be noted that direct costs for winter maintenance services on State-trunk highways and town roads are directly reimbursed by those units of government based on contractual agreements.

Jefferson County Highway Department
County Expenditures for Winter Mainteance

	2001	2002	2003
State Highway Winter Maintenance			
Salaries & Benefits	$97,042	$125,460	$125,265
Small Tools	2,392	3,237	4,461
Materials	7,369	(466)	3,819
Equipment Rental	96,298	110,610	112,664
Other Expenses	(741)	(390)	518
Admin Support Fee	8,168	9,612	9,981
Total State	**$210,529**	**$248,063**	**$256,709**
County Highway Winter Maintenance			
Salaries & Benefits	$101,432	$110,925	$111,274
Small Tools	2,494	2,910	3,964
Materials	91,282	111,952	163,168
Equipment Rental	106,564	94,703	99,123
Other Expenses	(24,729)	43,790	73,178
Overhead/Materials Charge	0	0	0
Total	**$277,043**	**$364,280**	**$450,708**
Local Municipal Winter Maintenance			
Salaries & Benefits	$41,439	$49,663	$48,209
Small Tools	1,090	1,254	1,700
Materials	39,331	44,338	40,594
Equipment Rental	55,300	53,832	53,002
Other Expenses	0	120	0
Overhead/Materials Charge	2,743	2,984	2,870
Total Local	**$139,904**	**$152,191**	**$146,375**
TOTAL WINTER MAINTENANCE	**$627,475**	**$764,534**	**$853,792**

Source: Highway Department CHEMS Reports.

Finding: As the peer county benchmarks indicate, Jefferson County is reasonably staffed for the State and County Patrol Sections and the length of these sections. As such the Highway Department provides an acceptable level of service for in-house winter maintenance of State and County highways. However, for all other winter operations, the Highway Department appears to maintain a larger than required capacity in personnel for winter operations. As of January 1, 2004 the Highway department was authorized 81 positions. About 21 of these positions are supervisory, office and support (mechanics, parts operations and custodial) positions. Approximately 18 of these positions are assigned on winter State and County trunk highway patrol. Another 13 positions are utilized for providing contract winter service to towns. Beyond these requirements all other employees are on a volunteer basis to help as called upon

for winter maintenance. The approximately 27 positions represent over 35 percent of the total work force that are not assigned on a regular basis for winter operations, except to help in the large storms or fill in for absent personnel. Allowing for an "above average" amount of snowfall does not require one third of the work force to be held in reserve, especially when 13 positions are utilized for contract work that is conducted simultaneously with the State and County operations. In a large snow fall the personnel working on the town roads could help on the State and County highways first and then accomplish their assigned town routes.

Non-winter Maintenance

In addition to winter maintenance, the County Highway Department is responsible for maintaining State and County pavement surfaces, roadways and right of way. The Department's main objective with regard to pavement maintenance is to improve the ride of the surface and obtain the maximum life expectancy out of the pavement. These services include crack sealing, seal coating, pavement rehabilitation, and reconstruction. In addition the County also operates its own gravel pit, crusher and asphalt mix plant. The Highway Department is organized and staffed for these activities to operate simultaneously. The Department has the ability to crack seal, chip seal, pave, clean ditches, run the crusher and mix plant, all at the same time. The chip seal and paving crews each have equipment operators (truck drivers) assigned to their particular activities.

The crushing and asphalt mix plant operations are primarily operated during the construction season. During the off season (November to March) the personnel may be used for winter operations, but are not permanently cross utilized for those winter activities.

Finding: The necessity of providing concurrent operations is questionable, particularly when reviewing the utilization of personnel through out the year and coupled with winter maintenance operation requirements. The mix plant and crushing operations can either be counter cycle operated through out the year, or staffed by part time or seasonal employees during the construction season. Except in extreme conditions, the crusher can be operated prior to and after the conclusion of the construction season to stock pile material. This allows the same personnel to operate both the crusher and mix plant. The other option is to operate both during construction season but with temporary personnel. Likewise, the chip seal and paving operations need to better cross level equipment operators (truck drivers). Each have their own equipment operators assigned for their specific operation. Another option is to utilize temporary personnel (some counties use highway department retirees) to augment or surge at certain times of the year. This option is only suggested for special projects that may require added personnel or equipment to support the project. If summer or seasonal employees are going to be used on a regular basis then a management analysis for cost effectiveness must first be performed and recommended to the County Board.

Recommendation: Based on the peer county reviews, best practices and our evaluation of the operation, it is our opinion the utilization of County Highway Department employees can be enhanced by cross leveling them between activities. When combined with winter maintenance operations it becomes readily apparent that the Highway Department can reduce its personnel without major impacts to the level of service currently provided. As a result of our review we

recommend that six (6) equipment operator I positions and four (4) equipment operator II positions be eliminated from the construction group. These reductions do not eliminate any services currently provided but do require management to coordinate and synchronize them. If an urgent project requires additional capacity to what the County has available on staff then the cost effective measure is to temporarily surge with contract equipment and personnel.

Construction

In many cases the term construction is misapplied to highway operations. In many cases there is a fine line between paving operations, full depth reconstruction, and complete new construction. In Jefferson County's case the Highway Department averages approximately two miles of full depth reconstruction per year. For the most part it appears this type of construction will be waning in the future as most of the county system which has required this type of activity is in reasonably good shape.

In recent years contractors have supplied laid in place asphalt overlays for several area towns. Prices have ranged from $26-28.00 per ton. As indicated elsewhere in this report it is difficult to compare the County's actual cost due to accounting methods. However it appears the County's estimate, at times, has exceeded the contractors bid. However, this may not be a reflection of the County's costs being high, as much as it reflects market conditions in the private sector. (Contractors short on work and cutting margins in order to cover overhead)

Finding: As long as the County has the benefit of its own rock crushing, asphalt mix plant and paving equipment it will be very difficult to outsource construction type activity from a financial standpoint. In the private sector the break even point from a volume standpoint is producing 150,000 tons of rock and 40,000 tons of asphalt mix per year. In recent years the county, using its equipment, has exceeded these levels.

Recommendation: Continue to utilize the resources available to the County in the form of the asphalt plant, crusher, paving machine and other heavy equipment. The County has already capitalized the cost of these units; therefore, the best return on investment is to utilize them for Jefferson County's benefit until they are ready for replacement. At some point in the future the real decision point will be whether to replace the crusher and asphalt mix plant or purchase these materials from the private sector. The decision point is a combination of the cost of repair, factored by the estimated length of extended useful life brought about by the repair vs. the cost of replacement factored by the estimated volume of material produced on an annual basis. This form of a cost benefits analysis should result in a comparison of what a reasonable ball park cost per ton can be achieved versus the cost to purchase from the private sector. This type of analysis also applies to major construction and heavy equipment purchases. The cost benefit should prove the purchase is worth while and supports the core function and mission accomplishment of the Highway Department.

REVIEW OF POTENTIAL SUBSIDIZATION

Background

This section of the report addresses questions related to the following issues:

- Are Jefferson County taxpayers subsidizing state, town, or other municipality road construction and maintenance activities?
- Do rates for maintenance and construction activities charged to towns and other municipalities cover direct, indirect, and overhead expenses?

To review these issues we performed the following activities:

- Reviewed the Highway Department's 2001, 2002, and 2003 financial statements from CHEMS and the county's financial system to identify total expenditures by business unit, by activity, and by selected customer.
- Reviewed Jefferson County Highway Department Annual Report of Highway Operations for 2000, 2001, 2002, and 2003 (selected schedules).
- Reviewed the Highway Department's procedures and practices for accumulating direct labor, materials, and equipment costs on state, county, and other projects.
- Reviewed the Highway Department's procedures and practices for calculating incidental labor and small tools rates.
- Reviewed sample billing statements showing charges to various types of customers.
- Reviewed the State of Wisconsin Department of Transportation's (WisDOT) methodology for calculating administrative overhead percentages (a.k.a. Records & Reports fee).
- Reviewed the Highway Department's practices related to charging non-State customers for maintenance, construction, materials, etc.
- Reviewed the County's program for local municipal highway and bridge aids.

Accumulation of Direct Expenditures

The Jefferson County Highway Department is an internal service fund for accounting purposes. Internal service funds are typically used to account for departments that provide services to other departments and/or entities on a cost reimbursement basis. The Highway Department provides services to the State of Wisconsin Department of Transportation (WisDOT), local cities, villages, and towns, other county departments, and other public and non-public agencies in and around Jefferson County on a fee for service basis. Services provided to maintain the county trunk system within the county is primarily funded through property tax levy.

Much of the information used to accumulate costs for services at all levels is generated by the department's employees who complete timesheets on a daily basis to track the following:

- County business unit used to account for all accumulated costs. The Highway Department has established business units that generally match the major functional activities performed. For the state highway system, business units have been created for each of the patrol sections that are covered in the county.

County highway activities have unique business units established for maintenance, construction, and winter maintenance. Other business units account for costs by type of entity (i.e. local governments, other county departments, non-governments, etc.).

- Project number corresponding to the work being performed. The Highway Department typically establishes a separate project number for each customer, and will further identify numbers for specific work projects when necessary.
- Activity code corresponding to the type of work performed on the project.
- Number of hours, including regular and overtime, worked on each project and activity during the course of the day.
- Unit Number and hours of operation for each piece of equipment that is utilized on a project during the course of the day.
- Type and amount of materials that is utilized on a project during the course of the day. This information is typically not entered on employee timesheets if the material is weighed at the yard. Either operators will have a weigh slip documenting the amount of materials taken from the yard, or materials slips are provided showing materials used.

The information on the timesheets is reviewed by the supervisors and then forwarded to the Highway office for data entry. The costs accumulated on the timesheets represent the direct labor and equipment utilized on projects and activities, with materials being documented by other sources. All of this information together forms the basis for all charges for service performed by the Highway Department.

Cost Pool Allocations & Overhead

In addition to the direct expenditures related to time, materials, and equipment, there are other costs incurred by the department during the course of its activities that need to be accounted for as well. These costs include:

- Incidental Labor: This includes the costs of non-productive salaries and wages for department employees (i.e. vacation, holiday, sick leave, etc.) and fringe benefits (i.e. social security, retirement, health/dental insurance, etc.). On an annual basis, the department calculates the incidental labor rate that is charged to projects based on direct labor. The calculation of this rate is based on the Uniform Cost Accounting System of Wisconsin County Highway Departments. The table below summarizes the incidental labor rate used by the department over the past several years.
- Small Tools: This calculated rate is also established under State policies. Small tools are defined by the State as those items purchased or built for use on multiple projects, which have a value less than $5,000. They typically include such things as shovels, brooms, ladders, safety items, barricades, flags, etc. These items are expensed in a separate cost pool for accounting purposes. On an annual basis, the department calculates a small tools rate based on the total amount of items purchased divided by the total direct labor costs expended during the year. This rate is charged to projects based on total direct and incidental labor. The minimum charge allowed by WisDOT is 1%, but the table below shows the rates charged by the Highway Department for the past few years.

Jefferson County Highway Department Selected Cost Pool Percentages				
	2001	2002	2003	2004
Incidental Labor	63.1%	81.1%	81.7%	82.9%
Field Small Tools	1.8%	2.9%	3.6%	2.9%
Source: Jefferson County Highway Department Worksheets.				

- Records & Reports: This rate is established by the State on an annual basis and is intended to cover costs related to administrative support provided by the Highway Department to WisDOT. County highway departments typically will also include this rate in charges for service to other entities as well. As of January 1, 2004, the State increased the records and reports rate to 4.5% from the previous 4%. This rate is applied to all project costs (direct and indirect). In Jefferson County, the Highway Department has had a policy of charging the records and reports fee to all customers with the exception of other County departments. For the local municipalities (cities, town, and villages), the Highway Department has established a policy of only charging a fee of 2%.

The Highway Department also operates some of its support functions that supply materials to the overall functioning through cost pools as well. The most significant of these are the pit and quarry, and bituminous operations. The expenditures for labor, incidental labor, small tools, materials, utilities, equipment rental, depreciation, insurance, and miscellaneous other expenses are charged to these business units through the County's accounting system. In addition to these expenses, the Highway Department will also make adjustments for inventory to record actual material on hand at the end of the year versus what the reports to date show is available.

At the beginning of each year, the Highway Department estimates the quantities that it expects to produce in these areas and develops a per ton rate that is charged through allocations to projects using gravel, sand, lime rock, hot mix, etc. At the end of the fiscal year, the Highway Department closes out the variances remaining in the accounts by allocating the difference mainly to the County Maintenance and County Construction business units. The following table summarizes the total expenses, allocations, and year-end variance for the past several years.

Jefferson County Highway Department Pit & Quarry and Hot Mix Operations				
	2000	2001	2002	2003
Pit & Quarry Operations				
Total Expenses	627,778	276,881	216,723	509,249
Total Allocations/Revenue	579,852	626,091	235,831	427,489
Variance Positive/(Negative)	(47,926)	349,210	19,108	(81,760)
Bituminous Operations				
Total Expenses	1,893,464	1,230,531	1,231,412	1,575,807
Total Allocations/Revenue	1,791,533	1,453,160	1,263,770	1,613,073
Variance Positive/(Negative)	(101,931)	222,629	32,358	37,266

Finding: County taxpayers do not appear to be subsidizing direct expenditures related to road construction or maintenance activities performed for state or local units of government.

The systems and policies utilized by the Highway Department appear to do a sufficient job of accumulating and charging customers for the direct costs of providing services for all activities. While there are issues related to the effectiveness of the system to provide true activity based costing information, this is common to virtually all Wisconsin county highway departments. In general, the systems and methods used to record and charge costs are established to meet WisDOT's needs for purposes of billing state related maintenance. While there is an accumulation of costs by activity, there are instances where the system does not allow for the charging of time spent during the course of the day that may not truly be project related. In many cases, employees are required to account for an entire day on one or more projects/activities, but the day may have included time that was general in nature and would normally not be considered billable to a specific project.

Additionally, the use of the cost pools and the establishment of rates for materials produced by the Highway Department, and the use of WisDOT's equipment rental rates do not allow for true cost identification. Further, the practice of closing variances in cost pools to primarily the County Maintenance and County Construction business units misstates the actual cost of providing services to all customers.

Recommendation: The Highway Department should create an activity to account for General Administration and other non-productive activities that are performed by employees, but are not for non-billable projects. Additionally, the Highway Department should undertake a complete review of all of its activity codes to ensure it is collecting an appropriate amount of detailed information to not only bill customers for services received, but also to enhance the ability to establish a system that could lead to full activity based costing.

Recommendation: The Highway Department should establish a more formalized cost accounting system that collects actual costs for services provided to customers. Variances in cost pools should either be allocated to all business units and documented costs recovered from the customers served during the year, or should be carried over and included in rates established in future years to ensure that all appropriate costs are being recovered.

Recovery of Administrative and Overhead Expenses

The Wisconsin Department of Transportation has established policies to document the costs of programs administrated by county highway departments to provide a uniform approach for reimbursement of costs. WisDOT's policy states, "it is intended that each routine maintenance agreement (RMA) and discretionary maintenance agreement (DMA) shall bear it fair share of costs recognized under these principles except where restricted or prohibited by law." For the most part, the application of this policy leads to the establishment of WisDOT allowable rates for administrative overhead (i.e., records and reports) and equipment rental rates. These rates are generally formulated based the average costs as reported by all county highway departments. In reality, this averaging by definition means that some counties "win" and some "lose."

While this policy and the established rates are intended to document costs and provide reimbursements for work performed by counties under contract with WisDOT on the state highway system, highway departments across the state have applied this to their

other customers as well. This section will discuss the County's experience in recovering administrative and other overhead costs for each type of customer.

State Highway System

As indicated above, the Highway Department charges a "records and reports fee" (administrative fee) that is applied to the full cost (direct labor, incidental labor, small tools, direct materials, and direct equipment) of all work done on the state highway system. Prior to January 1, 2004, the rate was 4%, but was increased to 4.5%. WisDOT reviews this rate on an annual basis and adjusts as necessary based on information that is reported by each county highway department.

In reviewing the 2002 administrative rates for all Wisconsin county highway departments, 57 of the 72 counties exceeded the 4% allowed by WisDOT during that year, while 42 exceeded the 4.5% rate that is now allowed. Since WisDOT and a committee of highway commissioners and business managers determine the allowable rate based on the state-side average for all highway departments, some receive reimbursements that more than cover their administrative costs, while others do not. Jefferson County is one of the few that has administrative rates below the 4% or 4.5% rates, and actually had the seventh lowest rate in 2002 among all county highway departments.

In 2002 (most recent full year available), the administrative cost rate for all counties was 4.75%. Jefferson County had a rate of 3.38%. The following table shows how this rate was determined, and uses a similar methodology to show what the 2003 rate is expected to be for Jefferson County.

Jefferson County Highway Department
2001, 2002, & 2003 State Administrative Cost Percentage [1]

	2001	2002	2003
Net Administrative Costs:			
BU 53110 Administration	$ 282,711.07	$ 259,022.24	277,925.96
Less: Committee Exp.	(10,985.98)	(11,305.53)	(13,683.71)
Total Net Administrative Costs	**$ 271,725.09**	**$ 247,716.71**	**$ 264,242.25**
Total Maintenance Costs:			
State Maintenance	1,128,267.16	1,709,255.80	1,563,663.05
County Maintenance	2,153,730.74	1,918,377.84	1,842,079.10
County Winter Maintenance	275,023.80	362,018.13	448,512.27
County Construction	2,359,003.45	1,739,121.40	3,060,205.80
Local Governments	998,933.37	970,661.47	893,168.26
Non Right-of-Way	73,061.95	472,288.27	473,164.75
Other Aid/Construction	139,767.92	159,421.93	435,465.61
Total Maintenance Costs	**$ 7,127,788.39**	**$ 7,331,144.84**	**$ 8,716,258.84**
State Administrative %	**3.81%**	**3.38%**	**3.03%**

Notes:
[1] Based on WisDOT methodolgy.

Finding: Based on the actual rate allowed by the state for the records and reports fee compared to the Highway Department's actual administrative percentage as calculated by WisDOT, county taxpayers did not subsidize the State for administrative overhead. Additionally, while the allowable rate for 2004 increased to 4.5% for 2004, the Highway Department's rate decreased to 3.03% (although the Highway Department will charge

the higher rate), resulting in additional recoveries beyond the actual administrative costs for state highway maintenance activities.

Over the past three years, the state has reimbursed the Highway Department between $50,000 and $75,000 for administrative support fees. The table below shows a breakdown of this reimbursement by business unit. Had WisDOT reimbursed the Highway Department based on its actual rate as calculated above, the County would have received approximately $11,400 less in 2002 and $16,500 less in 2003.

Jefferson County Highway Department Administrative Support Reimbursement from WisDOT			
Business Unit	**2001**	**2002**	**2003**
53191 Supervision	$ 3,661.76	$ 4,130.48	$ 4,759.75
53321 STH Maintenance	44,205.40	61,505.52	55,973.44
53322 STH Special Maint.	1,041.81	6,981.21	6,727.93
Total	**$ 48,908.97**	**$ 72,617.21**	**$ 67,461.12**

It should also be noted that in addition to the records and reports fee the Highway Department receives from WisDOT for work on the state highway system, there are also other reimbursements that fund various operations that benefit the state. These include reimbursements for the following:

- Patrol Superintendent: Prior to January 1, 2004, the state funded 50% of the Highway Department's total expenditures for supervision expenditures related to overseeing operations on the state highway system. This has been increased to 60% in 2004. In 2003, this reimbursement for Patrol Superintendent expenditures totaled nearly $119,000. The Highway Department also is allowed to charge the records and reports fee for the 50% of the supervision expenditures for state highway system paid locally.
- Communications Equipment: The state reimburses the Highway Department for a portion of the costs related to the use of radios or cellular telephones used in department vehicles. In 2003, this reimbursement totaled approximately $1,700.
- Insurance: The state reimburses the Highway Department for a portion of the general public liability, errors and omissions, and umbrella insurance premiums charged to the Department. In 2003, this reimbursement totaled nearly $20,000.
- Drug and Alcohol Testing: The state reimburses the Highway Department a percentage of costs related to drug and alcohol testing for full- and part-time employees required to have a commercial drivers license (CDL). The states reimbursement is equal to the greater of two times the number of winter patrol sections divided by the total number of employees required to have a CDL, or the actual number of employees assigned to winter maintenance on the state highway system divided by the total number of employees required to have a CDL. In 2003, this reimbursement totaled over $1,500.
- Storage Tanks & Other Equipment Storage: The state reimburses the county for the costs of storing various materials used in the maintenance of the highway system, and for storage of equipment.

Local Town, Village & City Customers

Unlike the practice its uses for work on the state highway system that follows the allowable administrative fee determined by WisDOT, the county has discretion to

establish its own policies for other customers. The Highway Department in Jefferson County has had a longstanding policy of charging the local towns, villages, and cities a 2% administrative fee.

The table on the following page shows the difference between the current practice of charging the 2% fee versus that applied for all other customers at 4% of total project costs. As the information shows, the Highway Department charged local municipalities a total of over $1,000,000 in total costs during 2001, nearly $828,000 in 2002, and nearly $980,000 in 2003. Based on the 2% fee, the Highway Department charged local municipalities administrative costs of between $16,000 and $21,000 in 2001, 2002, and 2003. If the 4% fee allowed during that period by the state for records and reports fee reimbursement was applied to the local units of government, the county would have recovered approximately $20,600 in additional administrative fees during 2001, $16,250 more in 2001, and $19,200 more in 2003. In looking at the information further, it becomes apparent that all county taxpayers are subsidizing those towns that receive more maintenance and construction related services.

Additionally, the Highway Department's actual administrative cost rate is really much higher than the rate that is determined following the WisDOT formula as shown above. This is because this rate only factors in costs related to services on the state highway system, excluding those that cover the rest of the department's operation. Furthermore as mentioned above, WisDOT reimburses the Highway Department for its share of other costs beyond the administrative cost rate (i.e., a portion of patrol supervision, communications, property and liability insurance, and drug and alcohol testing) for specific areas that benefit services provided to the state highway system as well. These other administrative cost items that are partially reimbursed by the state, are not included in the administrative cost rate. These other costs are valid expenses that should be included in the calculation of the rate for other non-state highway system work.

Earlier in this section, the methodology utilized by WisDOT in establishing the records and reports fee was presented, with a calculation showing how the Highway Department's administrative costs are lower than that the actual rate allowed and actually paid by the state. The following table shows the calculation of the full administrative cost rate based on all administrative expenses (net state reimbursements), and shows that the Highway Department's actual administrative rate is more than twice that calculated by WisDOT.

The most significant difference in the calculation of the actual rate compared to that presented earlier is the inclusion of net expenditures related to the Supervision business unit. The costs in this area cover not only supervision on the state highway patrol sections, but also include supervision for county maintenance and construction activities as well as other work performed by the Highway Department of local units of government.

Jefferson County Highway Department
Comparison of Overhead Charges
Difference between 2% Administrative Charge (Local Governments) and 4% Records & Reports Charge

	2001				2002				2003			
Towns/Cities/Villages	**Total Charges**	**Actual Overhead Charge**	**Overhead Charge @4%**	**Difference**	**Total Charges**	**Actual Overhead Charge**	**Overhead Charge @4%**	**Difference**	**Total Charges**	**Actual Overhead Charge**	**Overhead Charge @4%**	**Difference**
Town of Aztalan	45,739.80	896.86	1,793.72	896.86	32,666.76	640.53	1,281.05	640.52	38,630.41	757.46	1,514.92	757.46
Town of Cold Spring	80,200.18	1,572.54	3,145.11	1,572.57	112,774.06	2,211.24	4,422.51	2,211.27	110,842.89	2,173.39	4,346.78	2,173.39
Town of Concord	13,601.64	266.68	533.40	266.72	1,180.07	23.14	46.28	23.14	211.49	4.15	8.29	4.14
Town of Farmington	96,586.87	1,893.86	3,787.72	1,893.86	79,339.79	1,555.68	3,111.36	1,555.68	39,368.15	771.93	1,543.85	771.92
Town of Hebron	36,242.76	710.64	1,421.28	710.64	26,211.27	513.94	1,027.89	513.95	95,298.08	1,868.57	3,737.18	1,868.61
Town of Ixonia	58,248.25	1,142.13	2,284.24	1,142.11	36,648.45	718.60	1,437.19	718.59	15,739.49	308.62	617.23	308.61
Town of Jefferson	136,209.18	2,655.17	5,342.16	2,686.99	93,813.19	1,824.17	3,679.56	1,855.39	98,083.97	1,907.91	3,847.04	1,939.13
Town of Koshkonong	62,403.61	1,223.60	2,447.20	1,223.60	63,907.68	1,253.09	2,506.18	1,253.09	38,420.77	753.35	1,506.70	753.35
Town of Lake Mills	90,774.13	1,779.90	3,559.77	1,779.87	58,278.13	1,142.72	2,285.42	1,142.70	66,257.86	1,299.18	2,598.35	1,299.17
Town of Milford	14,370.96	281.79	563.57	281.78	6,693.18	131.24	262.48	131.24	10,274.92	201.46	402.94	201.48
Town of Oakland	92,193.96	1,807.73	3,615.45	1,807.72	37,854.24	742.24	1,484.48	742.24	26,234.82	514.41	1,028.82	514.41
Town of Palmyra	64,907.16	1,272.69	2,545.38	1,272.69	62,147.41	1,218.56	2,437.15	1,218.59	82,127.24	1,610.34	3,220.68	1,610.34
Town of Sullivan	1,831.61	35.91	71.83	35.92	5,889.67	115.49	230.97	115.48	24,559.25	481.55	963.11	481.56
Town of Sumner	80,084.19	1,570.29	3,140.56	1,570.27	77,781.90	1,525.14	3,050.27	1,525.13	89,630.62	1,757.47	3,514.93	1,757.46
Town of Waterloo	18,527.31	363.28	726.56	363.28	27,127.86	531.92	1,063.84	531.92	9,818.15	192.52	385.03	192.51
Town of Watertown	23,779.28	466.26	932.52	466.26	49,428.98	969.20	1,938.39	969.19	20,106.75	394.26	788.50	394.24
Village of Johnson Creek	1,931.57	37.87	75.75	37.88	842.51	16.52	33.04	16.52	74,655.58	1,463.84	2,927.67	1,463.83
Village of Palmyra	6,827.61	133.87	267.75	133.88	6,677.84	130.94	261.88	130.94	7,603.27	149.08	298.17	149.09
Village of Sullivan	5,583.28	109.48	218.95	109.47	3,403.32	66.73	133.46	66.73	9,811.41	192.38	384.76	192.38
City of Fort Atkinson	79,669.33	1,562.14	3,124.29	1,562.15	1,196.28	23.46	46.91	23.45	0.00	0.00	0.00	0.00
City of Jefferson	42,624.76	835.78	1,671.56	835.78	44,073.28	864.18	1,728.36	864.18	41,290.75	809.64	1,619.24	809.60
City of Lake Mills	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4,613.03	90.45	180.90	90.45
City of Waterloo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
City of Watertown	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	76,281.99	1,495.72	2,991.45	1,495.73
Total Local Governments	**$ 1,052,337.44**	**$ 20,618.47**	**$ 41,268.76**	**$ 20,650.29**	**$ 827,935.87**	**$ 16,218.73**	**$ 32,468.69**	**$ 16,249.96**	**$ 979,860.89**	**$ 19,197.68**	**$ 38,426.53**	**$ 19,228.85**
Total County Departments	117,919.13	0.00	0.00	0.00	443,845.10	0.00	0.00	0.00	324,253.63	0.00	0.00	0.00
Total Other Customers	59,856.65	1,173.66	2,347.32	1,173.66	309,339.98	6,065.46	12,130.98	6,065.52	237186.57	4,650.75	9,301.43	4,650.68
GRAND TOTAL	**$ 1,230,113.22**	**21,792.13**	**43,616.08**	**21,823.95**	**$ 1,581,120.95**	**22,284.19**	**44,599.67**	**22,315.48**	**$ 1,541,301.09**	**23,848.43**	**47,727.96**	**23,879.53**

Jefferson County Highway Department Full/Actual 2001, 2002, & 2003 State Administrative Cost Percentage			
	2001	**2002**	**2003**
Net Administrative Costs:			
BU 53110 Administration	$ 282,711.07	$ 259,022.24	$ 277,925.96
Less: Committee Exp.	(10,985.98)	(11,305.53)	(13,683.71)
BU 53191 Patol Superintendent	327,197.22	420,405.98	472,276.10
Less: State Reimbursement	(91,544.00)	(103,262.09)	(118,993.81)
BU 53192 Radio	11,369.31	9,902.63	4,438.90
Less: State Reimbursement	(1,610.11)	(2,596.86)	(1,735.49)
BU 53193 Insurance	24,253.08	18,722.97	29,835.92
Less: State Reimbursement	(12,128.27)	(11,927.23)	(19,556.21)
BU 53213 Drug & Alcohol Testing	3,748.46	6,248.62	7,127.65
Less: State Reimbursement	(1,460.97)	(1,370.32)	(1,561.26)
Total Net Administrative Costs	**$ 531,549.81**	**$ 583,840.41**	**$ 636,074.05**
Total Maintenance Costs:			
State Maintenance	1,128,267.16	1,709,255.80	$ 1,563,663.05
County Maintenance	2,153,730.74	1,918,377.84	1,842,079.10
County Winter Maintenance	275,023.80	362,018.13	448,512.27
County Construction	2,359,003.45	1,739,121.40	3,060,205.80
Local Governments	998,933.37	970,661.47	893,168.26
Non Right-of-Way	73,061.95	472,288.27	473,164.75
Other Aid/Construction	139,767.92	159,421.93	435,465.61
Total Maintenance Costs	**$ 7,127,788.39**	**$ 7,331,144.84**	**$ 8,716,258.84**
Full/Actual Administrative %	**7.46%**	**7.96%**	**7.30%**
Total Department Expenditures	$ 8,168,413.17	$ 8,346,648.83	$ 10,100,135.04
Central Services Allocated Costs	$ 163,965.00	$ 163,965.00	$ 199,545.00
Indirect Cost Rate	**2.01%**	**1.96%**	**1.98%**

If the actual administrative fee rate (as shown above) were used for charging the local municipalities, the total administrative reimbursement 2001 would have equaled approximately $77,000 in 2001, $64,600 in 2002, and $70,100 in 2003. This would have resulted in additional reimbursements totaling over $56,300 in 2001, $48,400 in 2002, and $50,900 in 2003. The table on the following page provides a summary of the administrative support subsidy by customer.

Finding: County taxpayers are subsidizing road construction and maintenance activities performed for local units of government because the Highway Department is not recovering the full cost of its administrative expenses using either the rate established by WisDOT (4% prior to January 1, 2004) or the modified methodology that includes the net costs not reimbursed by the state.

Jefferson County Highway Department
Comparison of Overhead Charges
Difference between 2% Administrative Charge and Full/Actual Administrative Percentage

	2001				2002				2003			
County Towns/Cities/Villages	**Total Charges**	**Actual Overhead Charge**	**Overhead Charge @7.46%**	**Difference**	**Total Charges**	**Actual Overhead Charge**	**Overhead Charge @7.96%**	**Difference**	**Total Charges**	**Actual Overhead Charge**	**Overhead Charge @7.30%**	**Difference**
Town of Aztalan	45,739.80	896.86	3,345.28	2,448.42	32,666.76	640.53	2,549.29	1,908.76	38,630.41	757.46	2,764.73	2,007.27
Town of Cold Spring	80,200.18	1,572.54	5,865.62	4,293.08	112,774.06	2,211.24	8,800.80	6,589.56	110,842.89	2,173.39	7,932.87	5,759.48
Town of Concord	13,601.64	266.68	994.79	728.11	1,180.07	23.14	92.09	68.95	211.49	4.15	15.14	10.98
Town of Farmington	96,586.87	1,893.86	7,064.10	5,170.24	79,339.79	1,555.68	6,191.62	4,635.94	39,368.15	771.93	2,817.52	2,045.59
Town of Hebron	36,242.76	710.64	2,650.70	1,940.06	26,211.27	513.94	2,045.51	1,531.57	95,298.08	1,868.57	6,820.35	4,951.78
Town of Ixonia	58,248.25	1,142.13	4,260.12	3,117.99	36,648.45	718.60	2,860.02	2,141.42	15,739.49	308.62	1,126.45	817.83
Town of Jefferson	136,209.18	2,655.17	9,963.13	7,307.96	93,813.19	1,824.17	7,322.33	5,498.16	98,083.97	1,907.91	7,020.85	5,112.94
Town of Koshkonong	62,403.61	1,223.60	4,564.03	3,340.43	63,907.68	1,253.09	4,987.31	3,734.22	38,420.77	753.35	2,749.72	1,996.37
Town of Lake Mills	90,774.13	1,779.90	6,638.97	4,859.07	58,278.13	1,142.72	4,547.98	3,405.26	66,257.86	1,299.18	4,741.98	3,442.80
Town of Milford	14,370.96	281.79	1,051.05	769.26	6,693.18	131.24	522.33	391.09	10,274.92	201.46	735.36	533.90
Town of Oakland	92,193.96	1,807.73	6,742.81	4,935.08	37,854.24	742.24	2,954.12	2,211.88	26,234.82	514.41	1,877.59	1,363.18
Town of Palmyra	64,907.16	1,272.69	4,747.13	3,474.44	62,147.41	1,218.56	4,849.94	3,631.38	82,127.24	1,610.34	5,877.73	4,267.39
Town of Sullivan	1,831.61	35.91	133.96	98.05	5,889.67	115.49	459.62	344.13	24,559.25	481.55	1,757.67	1,276.12
Town of Sumner	80,084.19	1,570.29	5,857.14	4,286.85	77,781.90	1,525.14	6,070.04	4,544.90	89,630.62	1,757.47	6,414.74	4,657.27
Town of Waterloo	18,527.31	363.28	1,355.04	991.76	27,127.86	531.92	2,117.04	1,585.12	9,818.15	192.52	702.67	510.15
Town of Watertown	23,779.28	466.26	1,739.15	1,272.89	49,428.98	969.20	3,857.40	2,888.20	20,106.75	394.26	1,439.01	1,044.75
Village of Johnson Creek	1,931.57	37.87	141.27	103.40	842.51	16.52	65.75	49.23	74,655.58	1,463.84	5,343.00	3,879.16
Village of Palmyra	6,827.61	133.87	499.35	365.48	6,677.84	130.94	521.13	390.19	7,603.27	149.08	544.16	395.08
Village of Sullivan	5,583.28	109.48	408.35	298.87	3,403.32	66.73	265.59	198.86	9,811.41	192.38	702.19	509.81
City of Fort Atkinson	79,669.33	1,562.14	5,826.80	4,264.66	1,196.28	23.46	93.36	69.90	0.00	0.00	0.00	0.00
City of Jefferson	42,624.76	835.78	3,117.46	2,281.68	44,073.28	864.18	3,439.44	2,575.26	41,290.75	809.64	2,955.12	2,145.48
City of Lake Mills	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4,613.03	90.45	330.15	239.70
City of Waterloo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
City of Watertown	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	76,281.99	1,495.72	5,459.40	3,963.68
Total Local Governments	**$ 1,052,337.44**	**$ 20,618.47**	**$ 76,966.24**	**$ 56,347.77**	**$ 827,935.87**	**$ 16,218.73**	**$ 64,612.68**	**$ 48,393.95**	**$ 979,860.89**	**$ 19,197.68**	**$ 70,128.41**	**$ 50,930.73**
Total County Departments	117,919.13	0.00	0.00	0.00	443,845.10	0.00	0.00	0.00	324,253.63	0.00	0.00	0.00
Total Other Customers	59,856.65	1,173.66	4,377.75	3,204.09	309,339.98	6,065.46	24,140.65	18,075.19	237,186.57	4,650.75	16,975.11	12,324.36
GRAND TOTAL	**$ 1,230,113.22**	**21,792.13**	**81,343.99**	**59,551.86**	**$ 1,581,120.95**	**22,284.19**	**88,753.34**	**66,469.15**	**$ 1,541,301.09**	**23,848.43**	**87,103.53**	**63,255.10**

Recommendation: The Highway Department should modify its current practice of charging only a 2% administrative fee to local towns, villages, and cities within Jefferson County. The Highway Department should recover either the rate established by WisDOT for administrative reimbursement on activities for the state highway system, or at a minimum, the Highway Department's actual administrative cost rate (3.03% for 2003 following WisDOT methodology).

While consideration should be given to the possibility of charging the Highway Department's full administrative cost rate, it also must keep in mind the affect this change may have on local government's decisions to utilize its services, which could affect overall workload capacity and related staffing needs.

Other Highway Customers

The Highway Department also has been charging other customers, with the exception other Jefferson County departments the 2% administrative fee. Based on the tables above, work performed for non-Jefferson County units of government and other entities has totaled just under $60,000 in 2001 to over $309,000 in 2002, and over $237,000 in 2003. This has resulted in administrative fee charges of nearly $1,200 in 2001, over $6,000 in 2002, and over $4,600 in 2003. Had the administrative rates allowed by WisDOT (4% in 2001, 2002, and 2003), the Highway Department would have received twice the reimbursement from these entities for administrative fees.

Furthermore, if the Highway Department had charged these customers the actual administrative rates during these years (7.46% in 2001, 7.96% in 2002, and 7.30% in 2003), the reimbursements would have nearly tripled. In 2001, the difference between the reimbursements based on the 2% rate charged and the actual administrative fee was $3,200. In 2002 and 2003, the additional reimbursements would have been approximately $18,100 and $12,300 respectively.

Finding: County taxpayers are subsidizing road construction and maintenance activities performed for non-Jefferson County units of government and other entities because the Highway Department is not recovering the full cost of its administrative expenses using the methodology established by WisDOT but which includes the net costs not reimbursed by the state.

Recommendation: The Highway Department should modify its current practice of charging only a 2% administrative fee to non-Jefferson County customers. The Highway Department should recover at a minimum, the allowable amount established by WisDOT for reimbursement purposes. Additionally, the County should discuss the merits of charging these customers the actual administrative rate for work done by the Highway Department.

While the Highway Department performs services for other Jefferson County departments, it has not charged administrative fees in the past. In 2001, the Highway Department billed other County departments approximately $118,000 for services. In 2002, this amount grew to nearly $444,000 due primarily to the work performed for Countryside. In 2003, the Highway Department provided nearly $325,000 in services, with nearly 43% of this amount for work done for Countryside.

Finding: The Highway Department is not receiving reimbursement for administrative costs associated with work performed for other County departments.

Recommendation: The county should continue its policy of not charging the administrative fee to other departments since from a broad perspective there is not a financial benefit overall. Since most of the departments receiving services from the Highway Department are primarily funded through tax levy, and considering that a large amount of the Highway Department's administrative expenses and overhead is also funded by levy, the County would not be generating additional revenue as a result of charging this fee internally. If there are departments that are funded by outside sources of money without support from the property tax levy, however, the County may wish to modify this policy to recover reasonable administrative expenses.

County-wide Indirect Costs

This table summarizing the full/actual administrative costs earlier in this section also included costs related to the county-wide central services cost allocation plan. These costs represent the value of services provided to the Highway Department and its services by county support functions (information technology, facilities maintenance, administration, human resources, accounting, corporation counsel, etc.). The indirect cost rates for 2002 and 2003 are based on the total allocated costs to the Highway Department from the county's 2002 and 2003 central services cost allocation plan divided by total expenditures.

As shown earlier in this section, the Highway Department received approximately $164,000 in services from the central business functions of the county in 2002, and nearly $200,000 in 2003, as identified in the central services cost allocation plan. The analysis also showed that the Highway Department's countywide indirect cost rate is approximately 2%.

If this indirect cost rate had been applied to total charges for all non-state highway system customers in 2001, 2002, and 2003 (as WisDOT would not reimburse the county for these expenses), and assuming the Highway Department had charged customers the 4% fee allowed by the state, the County would have received approximately $21,800 in 2001, $22,500 in 2002, and 24,100 in 2003. Applying the indirect cost rate to the actual administrative fee calculated earlier would result in a fully burdened administrative cost rate. Had this been done, the total subsidy provided to non-state customers would have been $81,300 in 2001, 89,000 in 2002, and $87,300 in 2003.

While these are reasonable and documentable cost supporting the operations of the Highway Department, some issues need to be considered before the county would choose to apply this rate to charges. For the most part, the costs allocated through the county's central services cost allocation plan are supported through the property tax levy. As a result, all county taxpayers are already funding these costs and if the indirect cost rate where applied to charges for service from the Highway Department, there would be an issue of "double billing." To alleviate this from occurring, the county could consider billing the Highway Department for these indirect costs and crediting the

revenue to each individual central service department thereby reducing the net expense that would be covered by the levy. Under this scenario, customers would be charged based on the true cost of service including all overhead, with those receiving the most support paying more of the overall cost.

Finding: There are customers of the Highway Department that do not pay property taxes to fund the operations of county government. While these services are a small percentage of the overall activity of the Highway Department, a case could be made to have these entities pay a fully burdened rate for services received. The county may also wish to include this fully burdened rate if it is billing outside parties/individuals for damage done to highway property and signage that would be billed back.

Recommendation: The county should consider including the indirect cost rate in the calculation of charges to non-Jefferson County governmental and all non-governmental customers receiving materials or services from the Highway Department. The benefits of implementing this policy would allow the county to recover its countywide administrative costs related to support of the Highway Department for those entities that do not pay property taxes to support the operations of Jefferson County.

County Highway Aids Programs for Local Municipalities

In addition to the subsidies provided to local units of government in Jefferson County, the County Board has also had a long established policy of providing road and bridge improvement aid to cities, villages, or towns that petition the county. The County Board appropriates funds for two programs that operate individually.

First, local cities, villages, and towns in Jefferson County can petition the County Board to appropriate funds for the improvement of roads within its boarders. Municipalities are limited to a minimum amount of $2,000 per year, with a maximum of $100 per mile of local roads. The municipality must also match the county aid amount.

Second, local municipalities within Jefferson County can apply for bridge aid to fund projects to improve culverts and bridges. Only projects estimated to cost in excess of $500 are eligible for bridge aids. The county's portion of the project is limited to 60% of the total project, excluding costs for design, engineering, right-of-way purchase, and construction of approaches more than 100 feet on either side of the bridge. Additionally, the county's share is adjusted if there are other aids available for the project. In those cases, the County will fund the balance of the project not covered by other aids up to the 60% level. Local municipalities are responsible for the other 40%.

The table below summarizes the aid that the county has expended over the past three years by municipality for these aid programs. The information also shows the total amount of property taxes levied to fund these programs each year.

For the road aids program, local municipalities have petitioned the county for in excess of $80,000 in total over the past three years. All of the towns and villages in Jefferson County have applied for the aid each year, as have the cities of Jefferson and Waterloo. The total amount of county property tax levied for local aid purposes has decreased

from over $95,000 in 2001 to over $82,000 in 2003. This decrease is primarily to due the cities of Fort Atkinson and Watertown not applying for the aid in 2002 or 2003.

The table below also shows the net expenditures for bridge aids by town in 2001, 2002, and 2003. While the Highway Department budgets for the full amount of anticipated requests for the coming year, the county's actual financial share is less since the towns reimburse 40% of all expenditures for projects completed by the Highway Department. Towns are not required to have the county perform the work, however.

Additionally, while municipalities may request bridge aid funds in one year, the project may not be completed in that same fiscal year. In these cases, the Highway Department carries over the unspent funds into a prior year. While this does not impact the levy, it could result in actual expenditures for the year being more than what was levied in that year. Revenue generated from the local municipalities 40% share of the project is recorded in the year the project is completed. Therefore, some municipalities may show negative expenditures if the county did not expend funds on a project in a particular year, but the local unit reimbursed the county for its share of a project authorized for funding in a prior year.

Jefferson County Highway Department
Road and Bridge Aid Expenditures for Local Municipalities

	County Road Aid			County Bridge Aid [1]		
County Towns/Cities/Villages	**2001**	**2002**	**2003**	**2001**	**2002**	**2003**
Town of Aztalan	3,425	3,425	3,398	6,547	4,343	1,607
Town of Cold Spring	2,493	2,451	2,451	1,910	0	4,752
Town of Concord	5,041	5,041	5,041	1,140	3,186	3,135
Town of Farmington	5,656	5,549	5,526	0	0	1,220
Town of Hebron	3,720	3,699	3,699	1,556	2,109	0
Town of Ixonia	6,294	6,314	6,314	0	0	0
Town of Jefferson	4,422	4,442	4,442	3,110	9,152	0
Town of Koshkonong	6,720	6,719	6,719	20,922	7,499	11,574
Town of Lake Mills	3,737	3,737	3,733	(1,566)	(0)	(0)
Town of Milford	4,256	4,256	4,256	0	3,248	(0)
Town of Oakland	4,781	4,781	4,978	9,232	10,961	2,441
Town of Palmyra	3,825	3,825	3,825	0	5,105	3,599
Town of Sullivan	3,862	3,952	3,952	0	940	0
Town of Sumner	2,537	2,537	2,537	836	3,065	0
Town of Waterloo	3,960	3,960	3,960	7,128	(3,768)	7,400
Town of Watertown	5,661	5,661	5,581	11,843	8,200	0
Village of Johnson Creek	2,000	2,000	2,000	0	0	0
Village of Palmyra	2,000	2,000	2,000	0	0	0
Village of Sullivan	2,000	2,000	2,000	0	0	0
City of Fort Atkinson	5,654	0	0	0	0	0
City of Jefferson	3,967	4,029	4,063	0	0	0
City of Lake Mills	0	0	0	0	0	0
City of Waterloo	2,000	2,000	2,000	0	0	0
City of Watertown	0	0	0	0	0	0
Miscellaneous	0	0	(97)	2,344	(66)	777
Total Local Governments	**$ 88,011**	**$ 82,378**	**$ 82,378**	**$ 65,002**	**$ 53,976**	**$ 36,505**
Total Levied	$ 95,281	$ 88,011	$ 82,378	$ 83,145	$ 53,184	$ 3,352

Notes:
[1] Total expenditures for bridge aids less 40% reimbursement for local share.

Finding: While these programs assists the local municipalities in funding road and bridge improvement projects, the Highway Department does not necessarily benefit from increased utilization of staff or equipment. While the Highway Department is given an option to bid on any work funded through these aid programs, the local municipalities are not required to award the projects to the County as terms for receiving the aid.

Recommendation: In times of limited budgets and a reluctance on the part of taxpayers to bear property tax increases, the County should evaluate the merits of continuing these two aid programs. If the programs are maintained, consideration should be given to removing these aid programs from the Highway Department's budget since it does not have discretion over the amount of aid requested by local municipalities, but the inclusion of it could affect the Department's ability of meet tax levy targets imposed by the County Board. It should be noted, however, that the County does benefit from the impact these aid expenditures have on the state transportation aids formula.

Summary

In looking at the overall system that accumulates costs related to Highway Department activities, it appears that the county taxpayers are not subsidizing the direct or incidental costs of labor, direct materials, or equipment. There is a subsidy being provided in the area of administrative costs however. The significance of this subsidy varies depending on the methodology for calculating the rate for recovering administrative costs.

The following table shows a summary of the subsidy county taxpayers are providing to the various categories of customers being served. The information compares the subsidy provided for administrative costs based on current practices, the actual rate allowed by WisDOT for each of the three years analyzed (4%), and the full administrative cost of 7.46% in 2001, 7.96% in 2002 and 7.30 in 2003. Lastly, we provide an estimate of the subsidy if the central service indirect cost rate were applied as well.

Jefferson County Highway Department
Summary of 2002 and 2003 County Taxpayer Subsidy by Type of Customer

	2001			2002			2003		
	Current	Actual	Full	Current	Actual	Full	Current	Actual	Full
State Highway System	$0	$0	$0	$0	$0	$0	$0	$0	$0
Local County Governments	20,650	56,350	76,975	16,250	48,400	64,800	19,225	50,925	70,325
Other Customers	1,175	3,200	4,375	6,075	18,075	24,200	4,650	13,325	17,025
Total Taxpayer Subsidy	$ 21,825	$ 59,550	$ 81,350	$ 22,325	$ 66,475	$ 89,000	$ 23,875	$ 64,250	$ 87,350

ANALYSIS OF OUTSOURCING ALTERNATIVES

The ability to provide a detailed comparison between the cost and effectiveness of road re-construction work performed by private contractors and the Highway Department is difficult. While it would be relatively easy to identify whether there is a level of interest on the part of private contractors for performing work, the question of cost is not as simple. The most significant hurdle to a comparison between the two entities is the fact that the plans and specifications on a project-by-project basis drives cost.

The ability to evaluate cost is also difficult because of the different accounting practices and methodologies each entity uses to accumulate costs and develop project estimates. Although both entities would theoretically review the same project plans and specifications to determine the costs and estimated duration for the project, the Highway Department would provide an overall "estimate" to perform the work, while private contractors must provide a "bid" to perform the work.

Generally, the private sector generally uses full cost accounting principles to track all of its expenditures, including direct labor, materials, equipment depreciation, overhead, and equipment usages, and builds these expenditures into the project cost when it is preparing its bid. The Highway Department's expenditures are generally lumped into business units and multiple activity codes that are structured to follow general governmental fund accounting principals, but do not allow for full cost accounting on a project-by-project basis. The Highway Department's system is intended to generate information for reporting purposes in accumulating costs to document reimbursements from WisDOT and other local customers and not necessarily tracking expenditures on a specific project. The Highway Department's accounting methodologies are further complicated as a result of multiple cost pools which accumulate charges and allocate costs based on percentages (e.g., incidental labor, small tools, administrative overhead) or rates based on annual averaged and/or estimated usage/production (e.g., asphalt, gravel, equipment rental). As a result, it is difficult to identify the Highway Departments actual costs for any specific project.

In practice, the Highway Department will review the project and provide an ***estimate*** of what it believes is it will take to complete the project. The County's estimate is approved by the Highway Committee and generally not adjusted, although additional work during the course of the project will lead to higher actual costs.

Meanwhile, a private contractor's ***bid*** is set once the project has been awarded, often based on lowest price. The actual cost of the project is subject to change, however, whenever the contractor identifies additional work that is not detailed in the specifications and plans. As a result, a private contractor will closely monitor a project for any changes that are not clearly defined. If a discrepancy in the scope of work and the plans and specifications is identified, the contractor will submit a "change order." Each time a contractor submits a change order, the overall cost and time to complete the project is modified. The change order process occurs after the project is awarded to the lowest bidder. Therefore, the lowest bidder has the ability to increase the price of the project after the project is awarded. This may result in an actual project cost that is more than the County's estimate or any of the other competing bids that were originally received.

Although this is a common practice used throughout the construction contracting industry, the Highway Department is not generally required to obtain change orders for unanticipated work during the construction process. If the Highway Department identifies an area that needs to be addressed, it will simply take steps to ensure that it is handled.

Examples of areas of work that commonly involve change orders is in cut and fill operations, also known as excavations below sub grade (EBS). Plans and specifications generally provide little information regarding subsurface soil conditions. Without accurate information regarding the presence of any unstable soils, private contractors respond with costs that are based on optimal soil conditions. Although the contractor's bid is arguably being responsive to the plans and specifications, the likelihood of a road reconstruction project having optimal soil conditions is unlikely. The presence of unstable subsurface materials such as sandy soils, glacial till, rock, or other unforeseeable subsurface conditions are present in most road reconstruction projects. An experienced contractor will provide a minimal allowance for cut and fill operations (based on optimal conditions) and provide an inflated unit price to haul unusable material away and an inflated price to provide fill material.

In summary, if a private contractor sees a deficiency in the plan, they will bid the unit costs for that item extremely high. This allows a contractor to propose what appears to be a low bid but often results in change orders and substantial cost overruns. In reality, any perceived savings by going with the low bidder is lost as the contractor utilizes the change order process to increase the profitability of the project. In comparison, the Highway Department will address these unforeseeable conditions as they occur and therefore, the original price estimate that may not have seemed as high when compared to a contractor's bid may be similar to what it would have been if the project had been outsourced.

Finding: The lack of a true cost accounting model is hindering the Highway County's ability to measure the feasibility of determining whether it would be more cost effective to utilize outside contractors on reconstruction projects.

Recommendation: The Highway Department should develop a standardized method of quantifying actual project costs (including labor, materials, equipment, and overhead), based on the practices used in the private sector. By providing comparable bid pricing, unit costs, and quantities, the County will be better able to evaluate the most efficient service delivery option. The objective of this recommendation is to begin to develop information that will allow for a comparison of road costs between the private sector and the Highway Department. This information will help the County identify any deficiencies in its road reconstruction practices and ensure that the residents receive the most competitive road services the market has to offer.

Recommendation: The County should institute a policy of seeking outside bids on selected projects and allow the Highway Department to submit a response using the same format as the private contractors are required to follow. The Highway Department's bid should be treated as a not-to-exceed amount that is documented similar to what would be required of the private contractors. Additionally, should the Highway Department be awarded the project, any

changes in project scope due to unforeseen circumstances would have to follow the same change order approval process required by the private contractors. Following this procedure will ensure that the County is receiving comparable information and will provide a better baseline for deciding whether outsourcing could be more cost effective.

FLEET MANAGEMENT

Preventative Maintenance Program

A well designed, executed, and managed preventive maintenance (PM) program is a prerequisite for cost effective and high-quality fleet maintenance. Maintaining vehicles and equipment, rather than fixing them when they break, not only controls the overall cost of maintenance and repair but also maximizes fleet availability because PM activities can be planned and scheduled to minimize the impact on operations.

Preventive maintenance includes the regularly scheduled inspection, adjustment, and refurbishment/replacement of vehicle components, systems and fluids aimed at identifying and correcting conditions that may cause future mechanical failures and expensive repairs. Good PM programs enable minor problems to be detected and corrected before they result in service-disrupting breakdowns and costly repairs. A PM program consists of thorough documentation of activities to be performed at specific time or usage intervals and scheduling and follow-up mechanisms that ensure that vehicles and equipment are serviced at these intervals. A high PM compliance rate (the number of PMs performed within a specified number of days of the date scheduled) is one of the keys to building an effective and efficient (as indicated by the total cost of repairs for each unit in the fleet) maintenance program. The industry standard for PM execution is 95 percent.

Finding: The Highway Department does not have an industry based preventive maintenance program. There is one mechanic assigned to do oil changes and lubes. Vehicle and equipment maintenance information is captured in a notebook but is not part of the vehicle history. The shop does utilize an oil analysis service which is a step in the right direction, but since there is no repair order system the PM is not documented.

Recommendation: We recommend that the Highway Department develop a comprehensive, coordinated, documented PM program that places preventative maintenance at the heart of all vehicle and equipment maintenance and repair services.

A comprehensive PM program will consist of multiple service levels (A, B, and C) that will include varying degrees of maintenance to be performed at predefined usage intervals. The PM program should be specific for different classes of vehicles and equipment and be consistent with the recommendations provided by the original equipment manufacturer. The service should be recorded and accurate PM information maintained in a fleet management system.

Due to the limited program currently in place, we believe it would be beneficial for the Highway Department to first develop an industry standard manual PM system. Our experience indicates that the start up and refinement of a manual system is much more cost effective than immediately commencing a fully automated one. As the Highway Department moves forward, it should develop its specifications for an automated fueling system and a vehicle management information system (VMIS) with the PM interface in mind.

Pre-Trip Inspections

Since mechanics usually only see a vehicle or piece of equipment a few times per year, the proper care of fleet assets is largely dependent on operator vigilance and cooperation. Policies and procedures governing the use, inspection and reporting of problems in vehicles and equipment can reduce the likelihood of improper use, abuse, and neglect. Pre-trip checklists, when properly used, can provide the mechanics with an assist in diagnosing and fixing problems. In turn, the mechanics can also speed repairs providing a faster turn around time. In addition, vehicles that require a commercial driver's license (CDL) to operate are required to use a pre-trip checklist.

Finding: No daily vehicle operator checklist is in use by the Highway Department's driver/operators before, during, or after operation. When a problem is discovered, verbal reporting is primarily used to report problems detected with operators at times conversing with their favorite mechanic.

Recommendation: The Highway Department should establish a vehicle inspection procedure for all drivers and equipment operators utilizing a written checklist. The driver or operator performing the inspection should sign the checklist and the record should be maintained by the Highway Department. At a minimum this process should be used by CDL drivers to meet liability requirements.

Staffing Fleet Maintenance

It is necessary to determine the appropriate number of mechanics that are required to maintain the fleet. The number of personnel who are employed to deliver services and the manner in which they are organized and deployed largely affects the performance of any fleet maintenance program. Organizational structures should reflect reasonable spans of control and channels of communication, consistent with formally defined authority and responsibilities. Staffing levels should be consistent with the amount of effort required to produce desired services in a productive, efficient, and effective manner.

In order to make some high-level judgments regarding the amount of maintenance effort and staffing levels needed to keep a fleet in good condition, each piece of equipment is measured according to the amount of maintenance effort generally required to keep an average sedan in good repair. The amount of this maintenance effort is expressed as one vehicle equivalent (VE) unit. Each general class of vehicle is assigned a vehicle equivalency that expresses the service effort required to maintain that vehicle as a multiple of fleet sedans. This provides a method of equating the level of effort and costs for dissimilar vehicles.

Typically, we will assign municipal mechanics/technicians a fixed number of VEs for which they will be responsible. This serves to identify staffing levels estimated to be appropriate for the size of the fleet in question. Eclipse has established a range for selecting the recommended number of VEs for the mechanics/technicians based on hundreds of engagements across the United States. Based on our experience, we assign an estimate – between 100 and 120 VEs per mechanic – as the foundation for making certain staffing recommendations.

Dozens of issues that are often specific to the fleet maintenance operation in question are used in the process of identifying the recommended staffing ratio. Each of these elements can be and are often used in the process of developing the recommended VE ratio. While there is no set formula for raising and lowering the ratio, decisions for developing the recommended VE ratio are made based on their experience and the elements listed below.

Element of Consideration	Ratio Raised (examples)	Ratio Lowered (examples)
The amount of outsourcing done	High level of outsourced work	Many labor-intensive tasks performed in house
The facilities in which the mechanics work	Very adequate facilities, supportive of the work performed	Inadequate facilities
The weather conditions	Moderate, temperate, little or no snow and ice	Cold, rainy, snow and ice present
The type of vehicle considered "front line"	Most of the fleet vehicles are relatively uncomplicated	Complex systems, multiple axles, highly specialized
The availability of spare parts within the municipality	Many parts sources, parts often delivered same day	Travel to other communities to obtain parts is often required
The type of procurement policies that are in place [vehicles and equipment]	Procurement of best-in-class models; Procurement of vehicles that matches the workload; attention to standardization; training is included; focus on warranties is strong	Procurement of lowest bidder; procurement of vehicles that inadequately match the workload; no attention to standardization; training is not included; warranty programs are not included/followed
The type of procurement policies that are in place [parts]	Parts procurement decisions are made based on quality of parts and/or dealer recommendations	Aftermarket parts used; fabricated parts used; rebuilt parts used
The location of the fleet vis-à-vis the maintenance facility	Co-located, staged at or adjacent to the fleet maintenance facility	Distant from the fleet maintenance facility
The type of mileage put on the vehicles	Highways available, used predominantly, miles are easy on the vehicles	Stop and go traffic, spurts of acceleration followed by brake application
Driving conditions	Paved streets, freeways, few traffic signals and stop signs	Potholes, jammed traffic, unusually long idling periods, off road, mud, ice, snow
Maintenance procedures—level of maintenance performed	Major component swap outs	Major component overhauls
The age of the fleet—replacement plans	Younger fleet based on strong and well-supported replacement plan	Aging fleet; older vehicles; procurement slippages prevail
Operator procedures—maintenance contributions made by the operators	Strong focus on first level maintenance, daily checks, maintenance reporting	Operators get in and go without routine daily checks
Focus on Preventive Maintenance	Strong focus on PM	Abundance of corrective maintenance
Type of information system in use	Robust fleet management information system	Manual, partial, or non-dedicated fleet management information system
Quality assurance procedures	Strong commitment to QA	Little or no QA available
Staging Options	Warm [indoor] storage	Cold [outdoor] storage
Customer surveys	Strong feedback system in place	Little or no feedback available
Self-evaluation	Strong self-evaluation system in	Little or no self-evaluation

Element of Consideration	Ratio Raised (examples)	Ratio Lowered (examples)
	place	
Training programs	Strong focus on training mechanics	Inadequate training program

Many other elements exist that will have an impact on the VE estimate. The ones shown above are just a few representative examples, but do help describe the process. For the elements shown, the VE ratio can be raised if certain positive operational characteristics are noted, and can be lowered if certain negative operational characteristics are noted.

If done correctly and effectively, fleet management requires a great deal of skill, but it is not an exact science. Dozens of management operations differ in many ways from location to location. A quick review of the elements described in the table above confirms that no single method can be "the best," because there are too many elements and too many variables associated with each.

Establishing a VE total for a municipal fleet is an exercise in statistical analysis. Assigning a VE ratio to a municipal fleet is not as mathematically based because of the multitude of variables and the associated processes that each municipality accomplishes as they deliver services. Consultants typically rely on their experience to reach the appropriate conclusion.

For example, a standard sedan is 1.0 vehicle equivalent and the typical two-ton truck rates 2.5 vehicle equivalents. This means that it takes about two and one-half times the effort to maintain a two-ton truck as it does to maintain a sedan. A backhoe is typically 4.0 VEs, which means it takes approximately four times as much effort to maintain a backhoe as it does a sedan.

Finding: We performed a VE analysis of the Highway Department's fleet and have determined it to be 372 VEs. Since the Highway Department's fleet maintenance operation does not maintain the Sheriff's Department's or other County vehicles, these units were not included in the VE analysis. Many of the standards on which we base the performance of a fleet organization reflect the total number of VEs maintained, not the number of vehicles and pieces of equipment in the fleet.

The Highway Department's current vehicle maintenance operation has a staff of ten employees as follows:

- 1-Shop Lead Worker;
- 5-Heavy Equipment/Fabricating Staff; and
- 4-Equipment Mechanics.

It is important to note that the Shop Lead Worker is currently spending approximately 1 percent of his time in the shop turning wrenches. In a fleet of this size and composition, this position should be spending at least 60 percent of his time turning wrenches and the remainder of his time managing the fleet and supervising employees.

Recommendation: Utilizing our benchmark number of 100 to 120 VEs per FTE mechanic, the Highway Department should have 4 mechanics, plus a Shop Lead Worker (372 VE's/100 VE's per mechanic) to maintain its fleet of vehicles and equipment. Given the average age of the fleet at 10 years (slightly over the norm)

for prime equipment, 21 years for back-up reserve units, and the aged facility condition that hinders the repair effort, we recommend that five mechanics be retained to maintain the Highway Department's fleet, including the Shop Lead Worker position. Overall, this is a reduction of five positions when compared to the current operation.

Shop Supervision/Management

The position of Shop Lead Worker is a union position and can lack authority in effectively managing the fleet maintenance operation. This situation often leads to poor employee management and inhibits the development and implementation of improved operation procedures.

Finding: There appears to be an unstable working relationship among mechanics and the Shop Lead Worker.

Recommendation: **The Shop Superintendent should assume the responsibility for the garage operation to include the parts room and fleet maintenance**

Mechanic Training

A fleet maintenance organization is dependent on a properly trained and qualified work force in order to provide high quality service at a competitive cost. Maintaining the skills and motivation of the work force over time as technology and equipment changes and natural employee turnover occurs, demands an ongoing training program.

An effective training process involves the identification of the need for training and the selection of and attendance at appropriate courses.

Finding: The Highway Department's fleet maintenance unit does not have a formal training program for its mechanics. While staff does receive training from vendors and manufacturers, it is limited and on an infrequent basis.

Recommendation: The Highway Department should develop an individual training plan for each mechanic based on the individual's skill level and requirements. While we recognize the difficulty in a small maintenance operation of making mechanics available for training, it is unrealistic to expect an in-house maintenance operation to function efficiently and effectively without ongoing mechanic training.

The Highway Department also needs to consider a better training program for mechanics. This training can improve in several ways. First, the Highway Department should work with the County's Human Resource Department to develop an employee pay incentive system for those employees that continually improve their educational skills through such organizations as National Institute for Automotive Service Excellence. This form of compensation greatly improves the overall morale, promotes pride and increases productivity.

Recommendation: The Highway Department should ensure that all bid specifications include mechanic training as a requirement for all new types of specialized vehicles and equipment.

Repair Order System

The base line of any vehicle shop operation is the ability to schedule, prioritize, record and store repair history on pieces of equipment and vehicles. The backbone for accomplishing these activities is a repair order (RO). The RO is the source document for vehicle maintenance activities. Supervisors should be programming work, developing priorities, and assigning personnel through means of an RO system. The RO should be the history document and the cost sheet for all work completed on the fleet.

Finding: Currently, there are no repair orders initiated and mechanics indicate concern over the fact that little or no vehicle history is available to them at the shop level. This is a standard procedure in any fleet. The lack of this information influences the ability to capture pertinent information that would expedite data entry into a VMIS or provide for the rapid retrieval of the hard copy that mechanics need to review past histories.

Recommendation: The Highway Department should implement a RO system as soon as possible. A manual system is preferable while the system parameters are developed and refined. In the future, the County should consider establishing an automated VMIS. Repair orders should be numbered sequentially to allow the mechanics to retrieve them quickly from the vehicle history files. The cost for all parts and labor required in the repair process must be thoroughly documented to determine the actual vehicle operating cost. Additional consideration should be given to providing an area on the edge of the form to allow imprinting time clock entries. This form of time card entry will aid in providing detailed tracking of component failure codes. The simple introduction of a repair order system should be implemented so that it works *with* the system instead of *against* it.

Vehicle Management Information System (VMIS)

Finding: The Highway Department's vehicle maintenance operation lacks any structured manual or automated management system.

Recommendation: The County should consider purchasing a VMIS or subscribing to an application service provider (ASP) to maintain this data. This system will provide for the development of "ad hoc" exception reports, which are critical in the decision, making process for:

- **Work order systems;**
- **Vehicle history;**
- **Automated preventive maintenance (PM) scheduling;**
- **Vehicle utilization monitoring;**
- **Fuel and oil consumption reporting;**
- **Mechanic productivity reporting; and**
- **Parts inventory management.**

Fuel Management

Finding: Currently the Highway Department does not have an automated fuel system. Records are kept manually based on a key system, which is transcribed for change back to the appropriate vehicle. The Highway Department has a full-time fuel person that is assigned to strictly monitor fuel sites and fuels all Highway Department vehicles and the Crusher unit. Currently the Sheriff's Department fuels at the Highway Department's site. However, the cost of administering this service is not charged back to the Sheriff.

Recommendation: The County should invest in an automated fuel dispensing system. The **introduction of an automated system at the main garage will allow for the introduction of Automated PM scheduling. The system should be activated at the remote suites and hand held units used for fueling field equipment. This system, when purchased, will be used to schedule all vehicles and equipment in the future. Furthermore, with the purchase of this system, we recommend the full time fuel person position be eliminated. The off site fueling responsibilities can be contracted with a fuel jobber and delivered to the construction site and fixed plant sites as needed.**

Equipment and Vehicle Parts Operation

One of the key support operations of any shop is the parts management activity. This area is a high dollar operation, which requires a measure of security to prevent theft and guard the accountability of the inventory control system.

Finding: Currently, the Highway Department's equipment and vehicle parts activity functions at a slightly less than acceptable level. One individual is appointed to the parts room to assist mechanics, in addition to a Parts Manger who is responsible for ordering and invoicing parts. For various reasons it appears that the Shop Lead Worker and Mechanics spend excessive time looking for parts in their absence. Overstaffing is apparent in the purchasing effort (Parts Manager). Parts procurement is accomplished through an established Purchase Order procedure, which appears to be sufficient in most respects. The lack of an automated inventory control process has allowed the opportunity for mis-management of inventory.

Recommendation: In our opinion the practice of mechanics ordering parts should be suspended immediately. This activity is best performed by the Parts Clerk in almost all occasions. The Highway Department should accelerate the steps to automate the inventory control method. This measure should be completed within six months. In addition the Parts Manager position is duplicating the functions of the office clerks and the parts clerk. We recommend this position be eliminated.

When to Replace a Vehicle

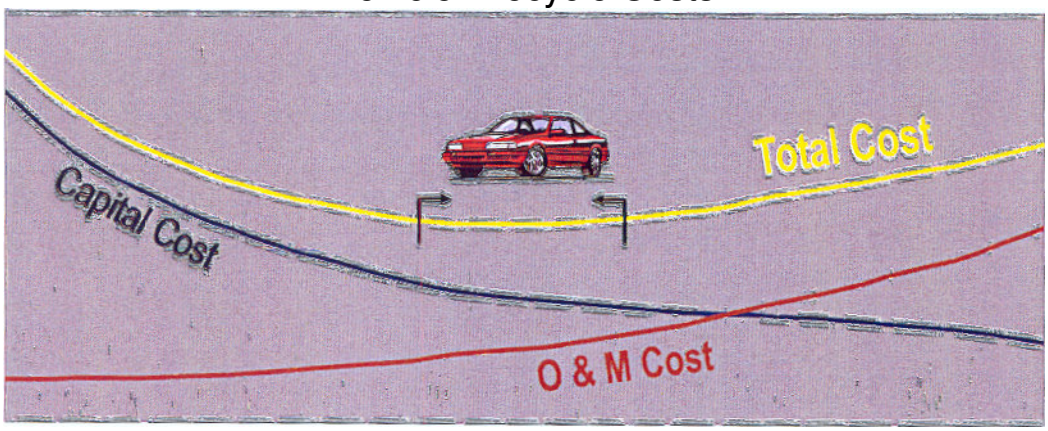
The economic theory of vehicle replacement holds that vehicles should be replaced when the sum of ownership and operating costs is at a minimum. The "Capital Cost" curve represents the decreasing cost of owning a vehicle over time, as the vehicle ages and depreciates. The operating and maintenance cost curve (O & M Cost) illustrates

the increasing maintenance and repair costs for the same vehicle over the same period of time. The "Total Cost" curve is the sum of the costs of the two.

From an economic standpoint, the asset should be replaced when the total cost curve is at its lowest point. This is the point in time when the combined cost of owning and operating a vehicle is at a minimum, just before it begins to increase. As the chart below reflects, the bottom of the total cost curve is actually relatively flat for a period of time. This means that there is not a single best moment to replace the vehicle. Rather, a period of time exists during which the combination of capital and operating costs are at their lowest and replacement is best accomplished during this period.

The chart below identifies the flat stable cost period for owning and operating a vehicle. Therefore, for this unit, the most appropriate time for replacement would be anytime between the black arrows.

Vehicle Lifecycle Costs



Time and Utilization

This period is different for each type of unit. The variability is caused by differences in the design and engineering of different types of units, the effects of differences in operating environments, the quality of care the unit receives, and several other factors. As a result, a replacement plan must use vehicle and equipment classification averages when developing replacement criteria. This provides the best replacement estimate for similar types of units.

Utilization

On a sampling of vehicle utilization it was noted that some major units of equipment lack the utilization criteria of:

- 750 miles per month average for light administrative vehicles; or
- 20 hours per month average for heavy construction equipment and special trucks.

Exhibit 1

Utilization EXHIBIT A

UNIT ID	Shop Equipment	Charge-out Issues	ITEM	HOURS, DAYS MILES, YDS.	OP. Unt	Months or Hours	Usage Per Month (ave.)	Model Year	Comments
TRUCKS & AUTOMOBILES									
9C			Ford Automobile Cr Vic	0	3	12	0		Sold at auction Oct. 27, 2003
10C		x	Ford Automobile Taurus	2,277	3	12	190	97	Auxilary unit - used for parts pick up, transport to schools/meetings, & other misc. uses.
12C	S	x	Chevy S-10 Blazer	6,640	3	12	553	99	Vehicle used by Highway Commissioner - 2003 use was 6,640 miles (wasn't included in financial report data)
28			IHC Truck (single)	229	1	20	11	94	Auger & Lift Truck - low miles/high use
29			IHC Truck (single)	92	1	20	5	94	Water tank attached - dust control at pits & quarries and on some rehab projects.
45			IHC Truck (tandem)	326	1	20	16	88	Auxilary unit - used for additional hauling capacity and Town/State snow plowing
53			Ford Truck (tandem)	314	1	20	16	96	Auxilary unit - used for additional hauling capacity and Town/State snow plowing
54			Ford Truck (tandem)	352	1	20	18	96	Auxilary unit - used for additional hauling capacity and Town/State snow plowing
85			Oshkosh Truck	0	1	20	0	79	V & Wing Plow Truck
86			Oshkosh Truck	0	1	20	0	79	V & Wing Plow Truck
87			Oshkosh Truck	0	1	20	0	80	V & Wing Plow Truck
89			GMC Truck (semi)	36	1	20	2	80	Auxilary 5th wheel tractor for moving crushing equipment, dust control with water tanker.
224	S	x	Ford Mini-Van (Wind)	27	1	20	1	95	Van used for Highway Committee field review and general transportation to schools, meetings, & conferences. (mileage understated)
6CT			Cat Tractor	0	1	20	0		Traded Jan. 16, 2003
10WT			John Deere Tractor	57	1	20	3	78	Old tractor with front mount broom attachment (35SW) - considering for disposal with recent purchase of 2nd self-propelled broom.
14WT		x	John Deere Tractor	38	1	20	2	78	Old tractor with front mount endloader attachment (14EL) - loads salt & materials at Ixonia Shop.
27WT		x	Ford Tractor	18	1	20	1	85	Primarily used for PTO with pump for filling water tanks for dust control on projects.
48WT			Terex Tractor	5	1	20	0	83	Endloader - limited use due to repair needs. Considering disposing of unit.
29MP		x	Allis Chalmers Mtr.G	0	1	20	0	46	1946 Grader - used occasionally for shoulder repair and by Parks Dept.
1PD		x	P.H. Digger	12	1	20	1		Post hole digger - PTO attachment for tractors.
RENTED			Fabco Cat Dozer	37	1	20	2		Leased equipment - returned after use completed.
35SW			MB Sweeper	57	1	20	3		Front mount broom attachment on 10WT.
37SW			MB Sweeper	58	1	20	3		Front mount broom attachment on 6WT.
1101			Tack Oil Tank	0	1	20	0		Bulk storage tank at mix plant for tack oil.
162	S	x	GMC Truck (welder)	31	1	20	2	83	Welding truck for field repairs & service. Low miles, but needed. (poor charge out methods possible)
200	S	x	Ford 1Ton 4X4 (Tractor)	52	1	20	3	91	Tractor mechanic vehicle for field repairs.
211	S	x	Ford Mechanic Truck	0	1	20	0		Shop mechanic vehicle for field repairs and used for parts pickup.
214	S	x	Ford F550 Mechanic Truck	19	1	20	1	2003	Shop mechanic vehicle (purchased in 2003)
220	S	x	GMC Safari Mini-Van	49	1	20	2	88	Older van used for crew transport
1061	S	x	Energetics Air Compressor	2	1	20	0		Air compressor on Truck 211
2010	S	x	Miller Welder	23	1	20	1		Welder/Generator on Truck 162
6WT			John Deere Tractor	68	1	20	1	74	Old tractor with front mount broom attachment (37SW) - considering for disposal with recent purchase of 2nd self-propelled broom.
		x =	Mileage or hours may be understated due to poor charge out methods or due to reporting methods that de-emphasize the need for accurate recording of mileage or hours.						
	S =	Shop vehicles that are charged to shop operation. Revenues on these pieces of equipment are realized when they are used or charged to non-shop operations or repairs. Costs for these pieces of equipment are recovered through shop overhead.							

Finding: Even though 2003 had a less than average anticipated snowfall amount, most equipment has in fact been adequately kept in service.

Recommendation: The Highway Department should develop more detailed utilization records with continual reporting. With the introduction of the suggested vehicle management information system, this may well correct itself if proper entry is made as the suggested VMIS evolves. The Highway Department also needs to review equipment utilization for equipment not being charged to specific jobs adequately. As Exhibit 1 depicts, and the Highway Department has verified, there are a number of units in the fleet that are not charged out adequately. This lack of chargeability makes a profound statement that not all costs for equipment are being captured. The lack of this chargeability understates the total cost of jobs, and furthermore, the County may be losing revenue if the unit(s) were used on state-funded projects.

Oshkosh Units

Most cities and counties in the central to southern half of the state of Wisconsin are choosing to purchase lower cost replacement units such as tri-axle dump trucks as does the County, in lieu of keeping the 6x6 Oshkosh trucks. These vehicles typically provide year round utilization at a lower operating cost yet are still capable of providing excellent

snow fighting capabilities. Other justifications local governments have given for the transition to these higher utilized vehicles include:

- Improved designs of roadways allows for less buildup of heavy snow;
- Faster responses to snow alerts reduce snow buildup;
- Higher speed plowing operations decrease snow accumulation;
- Advanced technological improvements in snow fighting equipment is available;
- Use of larger and more powerful and articulated equipment (i.e., loaders and graders); and
- Existing equipment are equipped with "V" plows and wings as added insurance in case trouble spots should arise.

Finding: The Highway Department's Oshkosh vehicles are out of date and no longer utilized.

Recommendation: The Highway Department should consider eliminating the 6X6 Oshkosh vehicles. These vehicles typically have very low utilization and were in the past purchased primarily for major snow removal operations. Unless the Highway Department can find other means to increase utilization, it should consider auctioning these vehicles off. One way to increase utilization of the Oshkosh trucks could be to keep at least one unit and mount the traffic attenuator to it. Another way could be to add a fifth wheel (tractor trailer) and use it as a tractor to pull trailers.

Replacement Policy

Any organization that maintains a fleet of vehicles should develop and implement a long term fleet replacement plan. A systematic vehicle replacement program provides more stable and predictable capital and operating costs, a safer fleet, improved vehicle reliability, potential reduction in fleet size, increased accountability for fleet related costs, and increased user satisfaction.

Finding: The Highway Department currently does not have a structured vehicle/ equipment replacement plan in place. The Highway Department uses various indicators that may or may not accurately reflect the true needs of the replacement cycle.

Recommendations: The Highway Department should work with the County Board to formally establish, adopt, and adhere to a replacement plan. The Wisconsin Department of Transportation has a guide based on very conservative parameters available for use by counties in developing an effective plan. The Department could start with WisDOT and then develop its own long-term, 10 to 20 year replacement program that incorporates all units of the fleet with the unique operating characteristics of Jefferson County.

Replacement Funding

Even the best replacement planning efforts will not succeed if the appropriate funding to renew the fleet is not available. It is important to recognize that a dollar of fleet replacement funding deferred is not a dollar saved. Fleet assets do wear out. Over time they not only become more unreliable, but more costly and unsafe to operate.

Decisions to defer replacement for a particular unit or type of unit beyond its planned service life will increase the average maintenance and repair costs for those units. This in turn will only aggravate the vehicle equivalency (VE) calculation for this unit or type of unit, which in turn will drive up the number of mechanics needed to maintain the fleet. It will also affect the manner in which the unit is utilized due to its actual or perceived drop in reliability. In our experience, significant deferment also leads to an overall increase in the size of the fleet due to the need, real or not, to have spare vehicles available. The ultimate need to replace the unit in question is not eliminated; it is only pushed to another year.

Replacement funding for vehicles and equipment is an accounting process whereby a fund is established and financed to provide for the orderly replacement of vehicles and equipment. An estimate of service life or usage is required when equipment is purchased and periodic accounting entries are made based on time or usage. Cash transfers can also be made to meet the fund balance. One advantage to this approach is that replacement funding tends to smooth the capital requirements during the life of the equipment.

Finding: There currently is a need for a structured replacement plan in Jefferson County. The average age of the wheeled/licensed fleet operated by the Highway Department is 10 years, excluding the seldom-used reserve fleet of trucks and various plows and attachments. The national norm for a fleet of this size and mix is 8 to 9 years indicating a need to slightly improve the equipment replacement process.

Recommendation: In addition to the establishment of a formal replacement policy, the Highway Department should develop a modified replacement plan for the near term that spreads the costs of renewing the fleet and eliminating any backlog over the next several years. This "smoothed" plan should be developed by overriding the initial replacement dates of specific units until later years. These units should be selected through various quantifiable measures such as annual usage, condition, life cycle costs, and projected repairs and maintenance.

Vehicle Acquisition/Specifications

Specifications define the technical configuration and capabilities, and/or the functional requirements of a vehicle or piece of equipment to be purchased. The manner in which specifications are developed and used not only affects the ultimate cost effectiveness and configuration suitability, but the level of effort and amount of time required to acquire vehicles as well. Effective specification processes incorporate information on user needs and maintenance organization experience with particular types of vehicles and components, and seek to balance custom design requirements with standard features. The methods used to acquire vehicles can have an impact on the price of a unit, the amount of time required to deliver it to a user, and the responsiveness of the vendor to customer needs.

Finding: The Highway Department does not have a formal written policy or procedure for defining the vehicle acquisition process.

Recommendation: We recommend that the Shop Superintendent, assisted by the Shop Lead Worker, remain the central authority and coordinator for vehicle and equipment specifications. However, we believe that it is important to have a mechanic and a representative from the group of operators that will be the end users of the unit involved in the specification development process.

Specifications can and should be structured to promote standardization without being so restrictive that only one product can qualify. The equipment bid specification should be written to:

- **Minimize the variety of vehicles and equipment;**
- **Incorporate parts/systems standards; and**
- **Require vendors to use readily available "off the shelf" components on their machines.**

Critical parts lists, service manuals, and user and/or mechanic training services should be included in purchase specifications for units that are new to the fleet or for specialized equipment whose operating and maintenance requirements are not self evident.

The County should attempt to leverage buying power by joining cooperative purchasing agreements with neighboring counties.

Contracting

In this age of specialization, micro chip systems, and regulatory requirements, mechanics are not trained extensively enough in areas such as hydrostatic transmissions and major component rebuilds. Providing major services at a quality level is not feasible. This is because the County cannot purchase the tools or test equipment to do most of these specialized repairs cost effectively.

There are a few functions that the Highway Department currently contracts out. These include:

- Upholstery
- Front end alignment
- Glass repair/installation
- Hydrostatic transmission (limited)
- Engine rebuilding (limited)
- Wrecker service
- Paint and body repair

In general, all jobs that require a high level of training, expensive tools and a relatively high salary to retain a specialized employee should be contracted to the private sector. These special areas also require the addition of staff as most are time consuming and take the mechanic away from basic fleet maintenance. Examples of these activities include diesel engine work and alignment.

Increased contracting will allow for:

- More advantageous prices;
- More expeditious turnaround; and
- Priority treatment.

Finding: The Highway Department's vehicle maintenance operation does not appear to contract an average amount of the operating budget to the private sector; in fact, they mount dump boxes, plows, hydraulic systems, plow hitches, and other attachments to vehicles. One of the reasons for this low outsourcing is the need to keep work in-house to provide utilization for mechanics.

Recommendation: The Highway Department should review its contracting requirements, but at a minimum, it should suspend mounting equipment, developing specifications and documentation for the current way the Department mounts its equipment, and incorporate this into its specifications, with photos of the preferred mounting included.

Once these specifications are written, the Highway Department must ensure that the vehicle that is delivered meets the pre-determined requirements, or that all the required items were included in the specification itself.

Performance Indicators

Typically performance statistics are used to compare the performance of a vehicle maintenance operation against the performance of other fleets of similar size and composition. The term *performance indicators* refers to a group of statistics that can be used to measure the effectiveness of a fleet management operation.

Finding: There are currently no performance indicators in place in the Highway Department. In this case we can not recommend specific performance indicators due to the lack of any structured RO system to justify or compare the statistics to.

Recommendation: A high priority for the Highway Department should be monitoring and evaluating of its fleet activity. The Shop's performance indicators should be monitored at specific intervals, and compared to the standards in the fleet maintenance business. Reports should be presented periodically to the Highway Commissioner as improvements in the Shop's operating performance continue to improve.

As the Highway Department develops an RO system, automated fuel system and VMIS this activity will be easier to accomplish. At best a few metrics might currently be developed using manually collected information. However, this would be very basic information and not the robust reports necessary to manage a fleet by today's standards.

Facilities and Grounds

Based on our review we are concerned with the perceived notion that certain members of the staff are too far removed from the day-to-day operations. At times, this physical separation can cause an unintended isolation between operating elements.

Finding: The current separation of the Highway Department's administrative office and the Highway Garage clearly cause a communication separation among staff. There is a mentality that it is "us versus them" as a result. In addition the current shop PM area and welding site are woefully inadequate by today's standards. Codes, air quality, lighting, and bay space are just a few of the items that no longer meet industry standards of today.

Recommendation: The County should conduct a "Site Master Plan Study" to develop a way to remodel and incorporate the Highway Department's administrative office with the current Shop office. Additionally, this review should include an analysis of moving the truck scale, creating a secure employee parking lot outside of the yard, and looking at building a new fleet maintenance area.

RECOMMENDED STAFFING AND ORGANIZATIONAL STRUCTURE

The Highway Department as previously indicated is within normal bounds for its State and County trunk highway sections. The shop, as identified in a previous section of the report, is overstaffed by approximately five positions plus the parts manager and the fuel truck driver. The operations which revolve around the construction operation are over staffed by ten positions.

In addition one patrol superintendent and the custodian have been suggested for elimination. The patrol superintendent is suggested because the overall supervisory levels within the Patrol Section are not warranted for the number of personnel and type of activity. Furthermore, in reviewing other counties we usually did not find two superintendents in the Patrol Section.

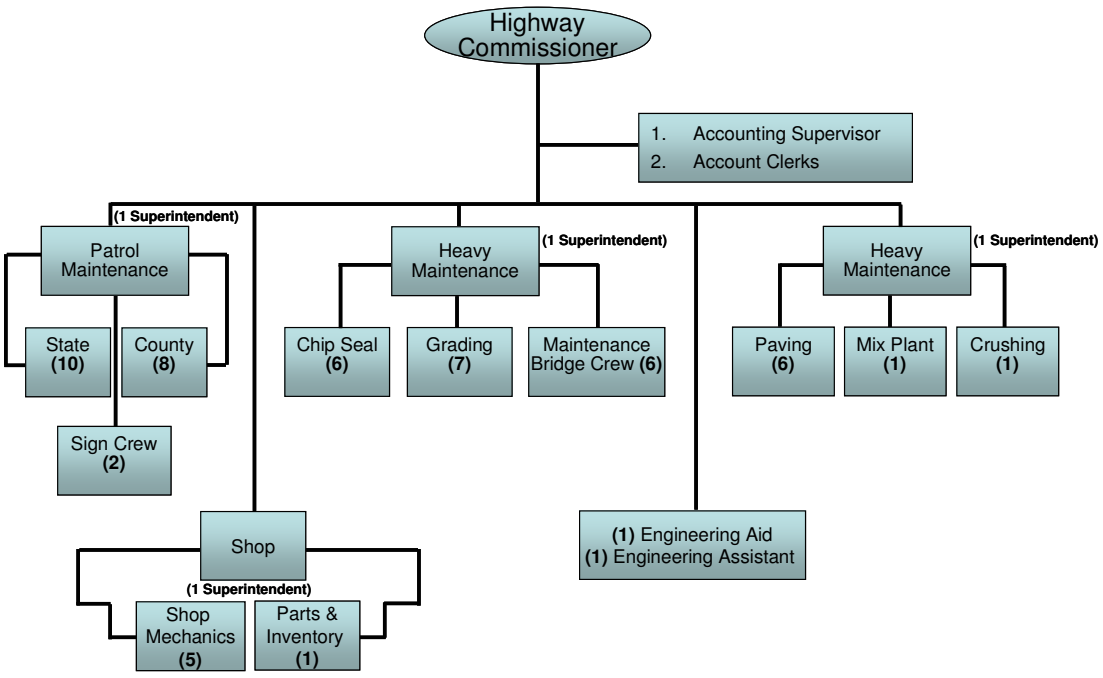
The need for a full time custodian does not appear to be fully justified. This activity can be contracted, added to the facilities maintenance responsibilities for the court house or put on a part time basis.

Finding: Based on benchmark information, best practices and the information gathered during our review, the Jefferson Highway Department is overstaffed by approximately nineteen positions. Currently the Department does not cross utilize personnel, to any great extent, between activities and as a result the various crews have become functional silos operating independently of one another.

Recommendation: We suggest the staff of the Highway Department be reduced by 19 positions. These positions are as follows:

Patrol Superintendent	**1**
Equipment Mechanic I	**1**
Welder Fabricator	**1**
Equipment Hauler	**1**
Equipment Maint.	**1**
Equipment Mechanic II	**1**
Equipment Operator II	**4**
Equipment Operator I	**6**
Parts Manager	**1**
Truck Driver/ Fueler	**1**
Custodian	**1**

It is our opinion that these positions can be eliminated without undo degradation to the level of service for the County residents or the contracts with the towns. The proposed organization chart below is one option for restructuring the Department.



Fiscal Impact of Recommended Position Reductions

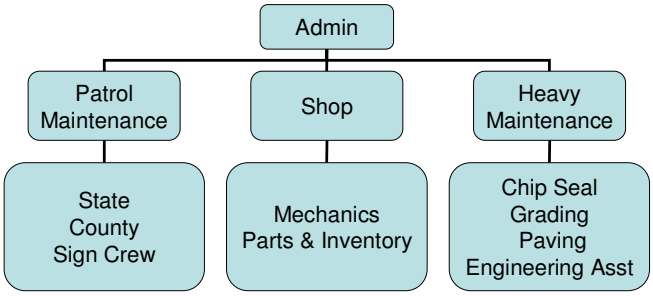
The following table provides a summary of the potential fiscal impact in terms of salary and fringe benefit savings the County would realize if the recommendations are implemented. This analysis is based on the current wage rates at the mid point on the current pay scale indicated in the collective bargaining agreements. While the analysis is based on the elimination of positions in specific job classifications, it should be noted

that the actual fiscal savings will be impacted by many things, including how "bumping" of staff based on seniority proceeds.

Based on the assumptions used in the above information, the County could expect to see a reduction in salary and benefit costs of just over $1 million annually as a result of the staffing recommendations. In the short-term, this savings will potentially be offset by the cost of unemployment compensation if the reductions are gained through layoffs. Should this occur, and individuals laid off file for unemployment compensation, the County would have to pay up to $162,500 for the 19 positions for twenty-six weeks, at $329 per week.

Alternatively, the County may reduce the Highway Department's staffing through attrition over the course of the next one to three years. Based on a limited review of the Highway Department's seniority listing, there are several individuals that are or will be eligible for retirement during the next year or two. Some of the reductions could be gained as a result of these retirements. However, it is important that the County establish a timeline for implementing these position reductions to gain the overall efficiencies in both operations and costs as discussed in this report.

Minimum Organization



One of the questions posed for this report was "What is the minimum staff size necessary to conduct winter operations for the county?" As a result a review was conducted with the following findings:

Total personnel with Highway Commissioner is 53 (+/- 2 personnel)

The Patrol Section requires - 20 personnel
Heavy Maintenance is the backup or relief drivers for the Patrol - 20 personnel. (The relief is based on an above average snowfall requirement.)
Shop – 6 personnel
Admin – 3 personnel
Superintendents – 3 personnel

The mix plant and crusher are gone along with 10 additional personnel. This would require the Department to meet State and County priorities first and then do towns in above average snows afterwards.

This structure would require considerable study by the staff as this does not provide the overall reduction in expenses that the study recommendation provides. An example of this is the off set of eliminating the mix plant and crusher, but then purchasing all of the construction materials from the private sector. This is one of the reasons we recommend implementing the first personnel cut, install system improvements and then continuously review operations for efficiencies and economy.

Levy Per Lane Mile Comparison

Earlier in this report, we provided an analysis of methodology and conclusions of the October 8, 2002 Highway Lane Mile Comparison Study prepared by the County Clerk's office. Based in the staffing recommendations contained in this report as summarized above, we have taken the information and examined the possible reasons for Jefferson County's ranking. In doing this, we asked ourselves, "What would Jefferson County's ranking have been had the Highway Department staffing and associated funding levels been at the levels recommended in this report for 1998, 2000, and 2002?"

If one assumes that the Highway Department had 19 fewer authorized positions, this would have potentially resulted in approximately $1,000,000 less in salary and fringe benefit expenditures for the current year. However, when factored with the cost of unemployment payments and averaged over the past three years the estimated net savings appear to us to be approximately $850,000 to $900,000. It is also assumed that this reduction in cost would have had an equal affect in lowering the property tax levy for the Highway Department. Based on this, the Highway Department's 3-year average property tax levy would have fallen from $3,381,434, to $2,531,434, resulting in a levy per lane mile of $4,887. The $4,887 levy per lane mile would have been 3.1% higher than the eight peer county average of $4,737, and Jefferson County would have been ranked just above the median county having a ratio of $4,434.

Using the same assumptions, the effect on the total lane-mile per employee ratio would have been increased (improved) from 12.1 to 15.3 for Jefferson County, compared to the eight county peer average of 18.

Hence, it appears that the initial study results showing concern for Jefferson County's ranking on these two ratios is largely explained by the Highway Department being overstaffed. Implementing the recommendations in this report should not only allow the Highway Department to provide its current level of service, but should also improve its overall comparative cost effectiveness.

Appendix A

Jefferson County Highway Department
County Expenditures by Major Function

	2001	2002	2003
HIGHWAY DEPARTMENT SUPPORT FUNCTIONS			
Administration			
Salaries & Benefits	$237,939	$271,570	$246,009
Committee Expenses	10,986	11,306	13,684
Other Expenses	29,277	(26,776)	17,169
Equipment Rental	0	86	0
Depreciation	4,510	2,836	1,183
Total	**$282,711**	**259,022.24**	**278,044**
General Engineering			
Salaries & Benefits	$16,605	$29,733	$18,364
Other Expenses	1,745	2,739	1,473
Equipment Rental	2,173	3,717	2,194
Depreciation	1,753	1,629	404
Total	**$22,275**	**37,818**	**22,435**
Supervision			
Salaries & Benefits	$288,157	$320,340	$407,549
Other Expenses	5,849	65,057	18,147
Equipment Rental	33,191	35,009	45,130
Depreciation	0	0	1,449
Admin Support Fee	3,662	4,130	4,760
Total	**$330,859**	**424,536**	**477,036**
Radio Expenses			
Salaries & Benefits	$0	$0	$0
Other Expenses	5,007	5,932	4,439
Equipment Rental	0	0	0
Depreciation	6,362	3,971	0
Total	**$11,369**	**9,903**	**4,439**
Liability Insurance			
Salaries & Benefits	$0	$0	$0
Other Expenses	24,253	18,723	29,836
Equipment Rental	0	0	0
Depreciation	0	0	0
Total	**$24,253**	**18,723**	**29,836**
Drug & Alcohol Testing			
Salaries & Benefits	$1,368	$1,929	$1,934
Other Expenses	5,002	4,174	4,968
Equipment Rental	300	146	226
Depreciation	0	0	0
Total	**$6,670**	**6,249**	**7,128**
TOTAL DEPARTMENT SUPPORT	**$678,138**	**$756,251**	**818,918**
STATE HIGHWAY SYSTEM			
State Highway Maintenance			
Salaries & Benefits	$468,875	$653,815	$620,018

Jefferson County Highway Department
County Expenditures by Major Function

	2001	2002	2003
Small Tools	9,020	18,294	21,901
Materials	87,647	179,412	93,525
Equipment Rental	291,639	368,505	319,328
Other Expenses	50,552	86,188	106,007
Admin Support Fee	36,037	51,894	45,992
Total	**$943,769**	**$1,358,108**	**$1,206,771**
State Highway Winter Maintenance			
Salaries & Benefits	$97,042	$125,460	$125,265
Small Tools	2,392	3,237	4,461
Materials	7,369	(466)	3,819
Equipment Rental	96,298	110,610	112,664
Other Expenses	(741)	(390)	518
Admin Support Fee	8,168	9,612	9,981
Total	**$210,529**	**$248,063**	**$256,709**
State Highway Road & Bridge Construction			
Salaries & Benefits	$12,490	$50,849	$52,350
Small Tools	225	1,473	1,875
Materials	1,843	94,482	81,689
Equipment Rental	8,739	24,530	30,144
Other Expenses	2,750	3,196	2,141
Admin Support Fee	1,042	6,981	6,728
Total	**$27,088**	**$181,512**	**$174,927**
TOTAL STATE HIGHWAYS	**$1,181,386**	**$1,787,682**	**1,638,406**
COUNTY HIGHWAY SYSTEM			
County Highway Maintenance			
Salaries & Benefits	$802,212	$841,283	$759,951
Small Tools	15,548	23,239	26,786
Materials	416,669	319,161	267,486
Equipment Rental	500,165	386,897	315,340
Other Expenses	419,137	347,798	472,516
Overhead/Materials Charge	0	0	0
Total	**$2,153,731**	**$1,918,378**	**$1,842,079**
County Highway Winter Maintenance			
Salaries & Benefits	$101,432	$110,925	$111,274
Small Tools	2,494	2,910	3,964
Materials	91,282	111,952	163,168
Equipment Rental	106,564	94,703	99,123
Other Expenses	(24,729)	43,790	73,178
Overhead/Materials Charge	0	0	0
Total	**$277,043**	**$364,280**	**$450,708**
County Highway Construction			
Salaries & Benefits	$614,598	$376,695	$684,139
Small Tools	11,104	10,914	24,629
Materials	1,168,261	767,613	1,304,827
Equipment Rental	690,793	327,495	617,971
Other Expenses	15,329	419,509	871,420

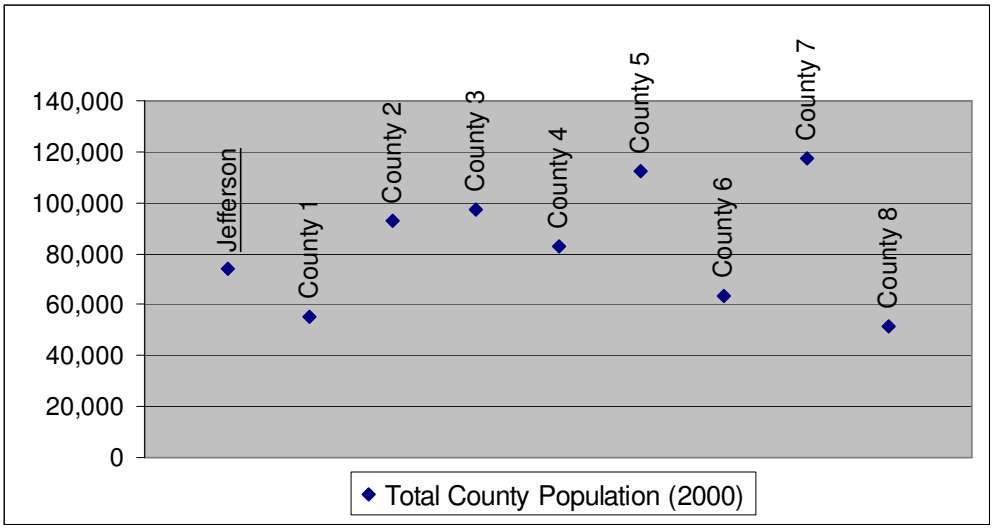
Jefferson County Highway Department
County Expenditures by Major Function

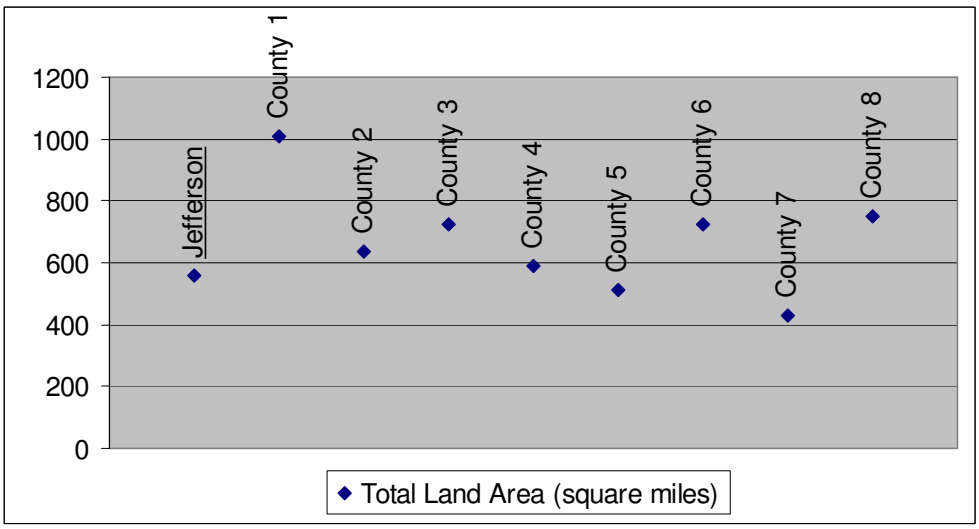
	2001	2002	2003
Overhead/Materials Charge	0	0	0
Total	**$2,500,086**	**$1,902,226**	**$3,502,985**
TOTAL COUNTY HIGHWAYS	**$4,930,860**	**$4,184,884**	**$5,795,773**
LOCAL MUNICIPAL ROAD SYSTEM			
Local Government Road Maintenance			
Salaries & Benefits	$101,528	$102,709	$111,224
Small Tools	2,001	2,760	3,943
Materials	63,271	68,099	74,971
Equipment Rental	70,368	52,096	68,286
Other Expenses	36,690	11,312	84,198
Overhead/Materials Charge	5,404	4,733	6,852
Total	**$279,262**	**$241,709**	**$349,475**
Local Municipal Winter Maintenance			
Salaries & Benefits	$41,439	$49,663	$48,209
Small Tools	1,090	1,254	1,700
Materials	39,331	44,338	40,594
Equipment Rental	55,300	53,832	53,002
Other Expenses	0	120	0
Overhead/Materials Charge	2,743	2,984	2,870
Total	**$139,904**	**$152,191**	**$146,375**
Local Municipal Construction			
Salaries & Benefits	$110,751	$96,038	$78,768
Small Tools	1,994	2,785	2,836
Materials	417,176	266,107	329,786
Equipment Rental	115,524	80,839	66,683
Other Expenses	12,552	(576)	(22,875)
Overhead/Materials Charge	12,471	8,502	9,475
Total	**$670,468**	**$453,695**	**$464,673**
Local Municipal Road & Bridge Aids			
Local Road Aids	$95,281	$76,683	$82,378
Local Bridge Aids	30,545	33,877	24,857
Total	**$125,826**	**$110,560**	**$107,235**
TOTAL LOCAL MUNICIPALITIES	**$1,215,460**	**$958,155**	**$1,067,757**
SERVICES TO COUNTY DEPARTMENTS			
Maintenance Services			
Salaries & Benefits	$2,450	$7,609	$19,913
Small Tools	45	221	717
Materials	12,707	10,248	8,996
Equipment Rental	4,129	6,215	7,991
Other Expenses	75,239	48,920	68,381
Overhead/Materials Charge	0	0	0
Total	**$94,572**	**$73,213**	**$105,997**
Construction Services			
Salaries & Benefits	$4,591	$106,913	$70,704

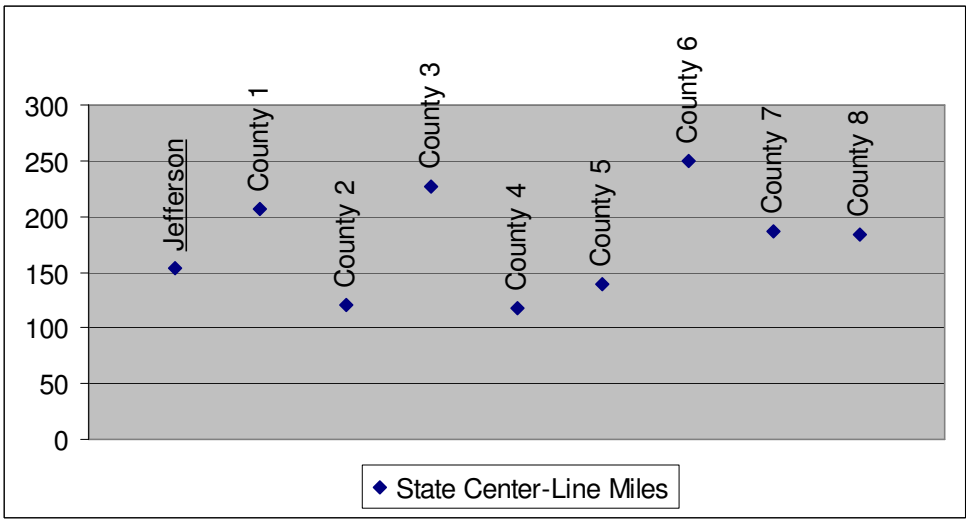
Jefferson County Highway Department
County Expenditures by Major Function

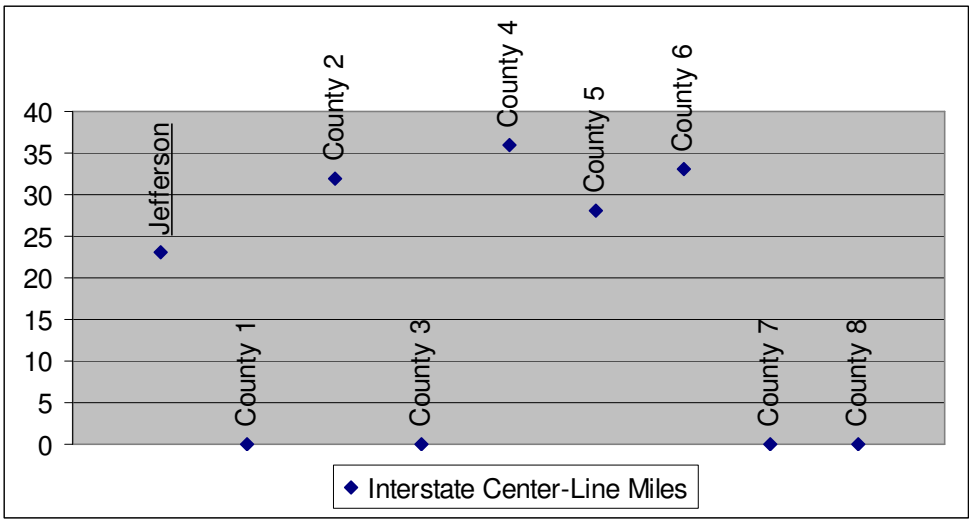
	2001	2002	2003
Small Tools	83	3,100	2,510
Materials	8,118	93,111	92,597
Equipment Rental	6,886	121,798	48,718
Other Expenses	0	45,371	3,728
Overhead/Materials Charge	0	0	0
Total	**$19,678**	**$370,292**	**$218,257**
TOTAL COUNTY DEPARTMENTS	**$114,249**	**$443,505**	**$324,254**
SERVICES TO NON-COUNTY CUSTOMERS			
Maintenance Services			
Salaries & Benefits	$9,371	$61,323	$53,345
Small Tools	177	1,772	1,920
Materials	32,090	103,880	47,218
Equipment Rental	5,555	56,996	54,363
Other Expenses	1,204	16,395	(50,151)
Overhead/Materials Charge	968	4,807	2,134
Total	**$49,365**	**$245,173**	**$108,830**
Construction Services			
Salaries & Benefits	$3,652	$20,828	$41,928
Small Tools	66	604	1,509
Materials	3,367	17,728	49,507
Equipment Rental	3,200	22,085	32,896
Other Expenses	0	1,664	0
Overhead/Materials Charge	206	1,258	2,517
Total	**$10,492**	**$64,167**	**$128,357**
TOTAL NON-COUNTY	**$59,857**	**$309,340**	**$237,187**
TOTAL HIGHWAY DEPARTMENT	**$8,179,950**	**$8,439,817**	**$9,882,294**
	8240574.68	8442920.57	10193006.14
	($60,625)	($3,104)	($310,712)
	60627.59	3103.56	310712.92
	2.47	0.06	0.86

Appendix B Benchmark Results





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35
30
25
20
15
10
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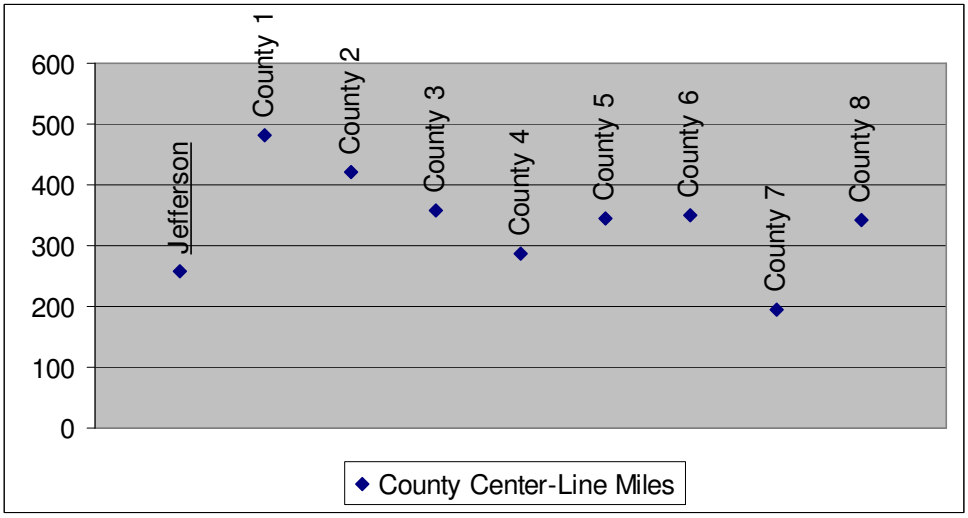
Jefferson
County 1
County 2
County 3
County 4
County 5
County 6
County 7
County 8
Interstate Center-Line Miles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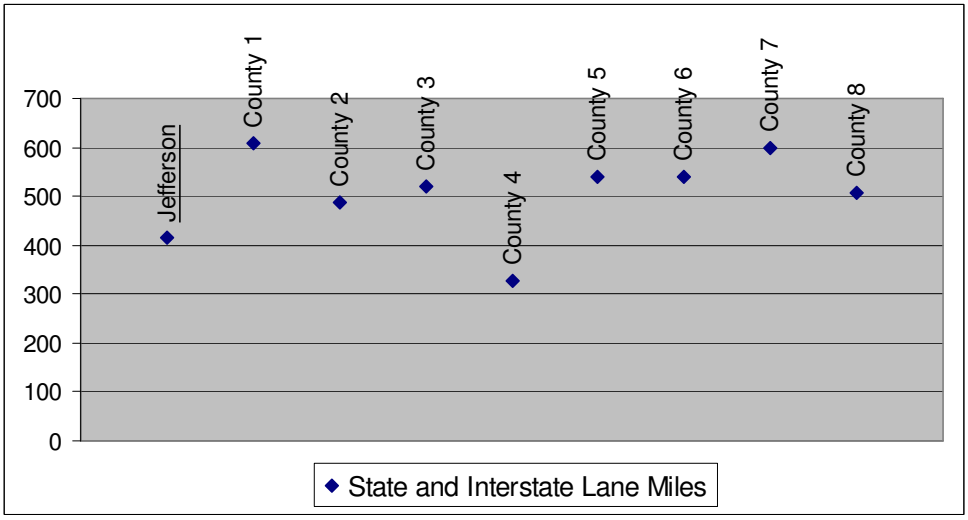
Jefferson
County 1
County 2
County 3
County 4
County 5
County 6
County 7
County 8
County Center-Line Miles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600
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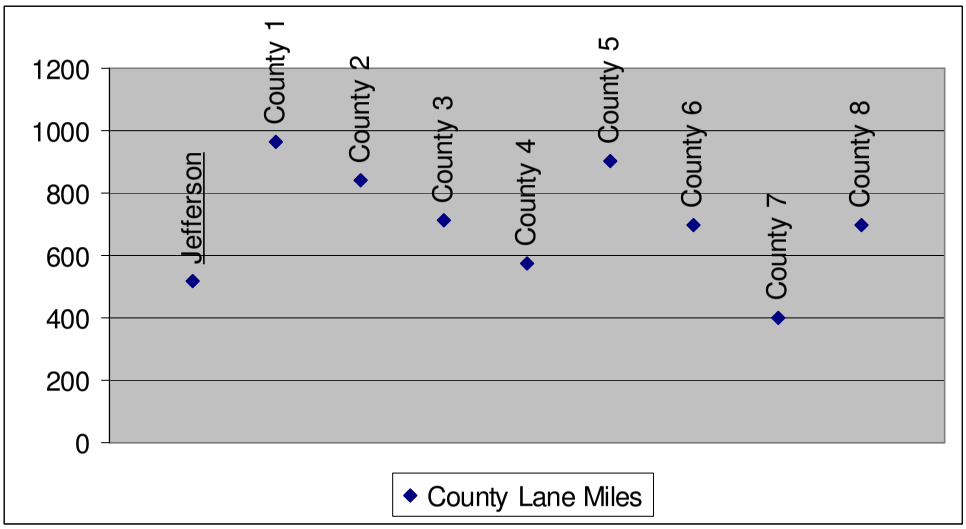
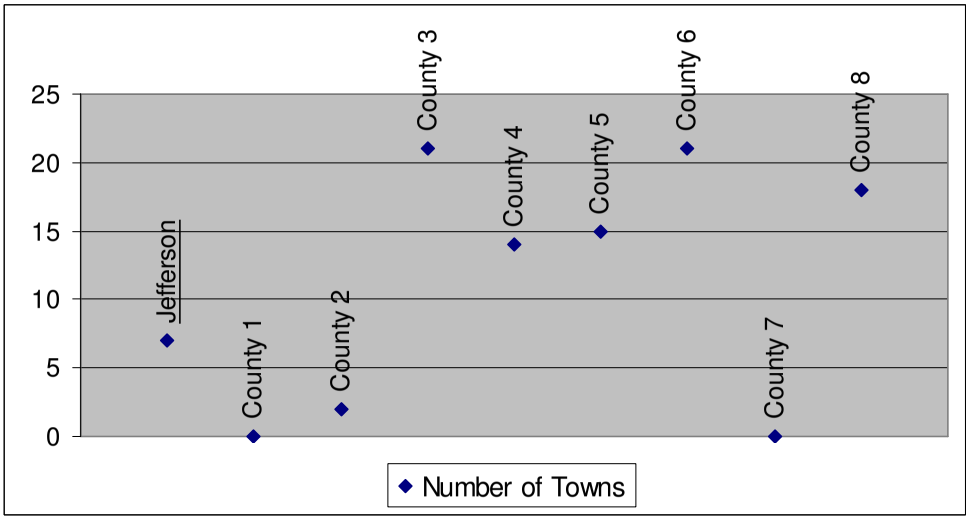
400
300
200
100
0
Jefferson
County 1
County 2
County 3
County 4
County 5
County 6
County 7
County 8
State and Interstate Lane Miles


1200
1000
800
600
400
200
0
Jefferson
County 1
County 2
County 3
County 4
County 5
County 6
County 7
County 8
County Lane Miles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10
5
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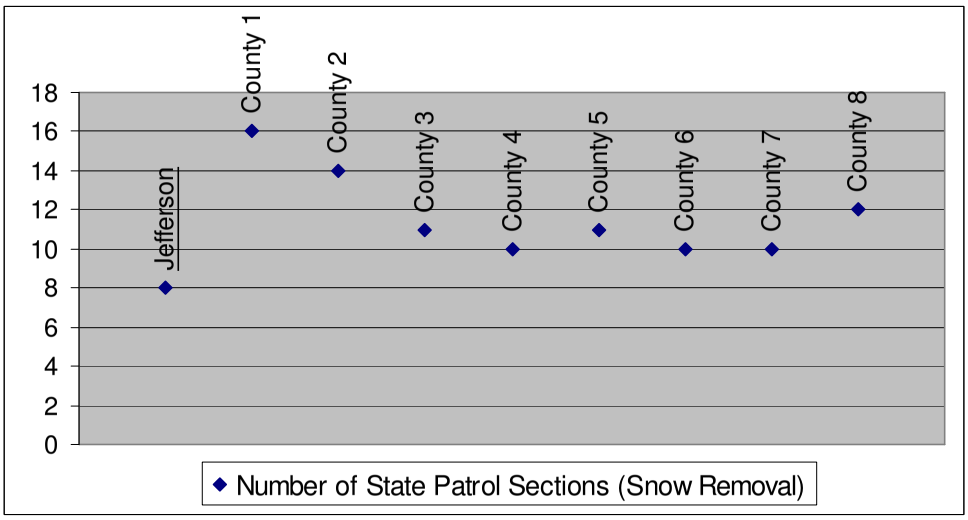
Jefferson
County 1
County 2
County 3
County 4
County 5
County 6
County 7
County 8
Number of Towns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14
12
10
8
6
4
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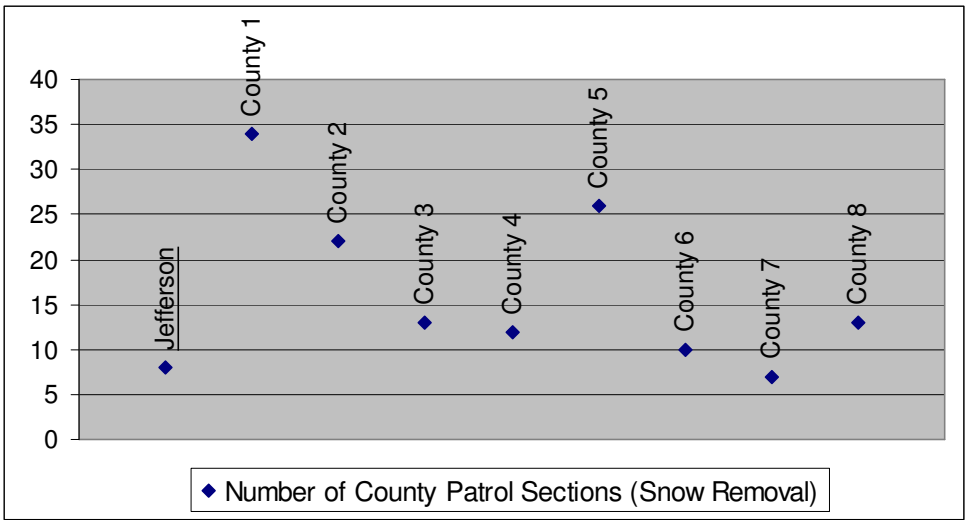
Jefferson
County 1
County 2
County 3
County 4
County 5
County 6
County 7
County 8
Number of State Patrol Sections (Snow Removal)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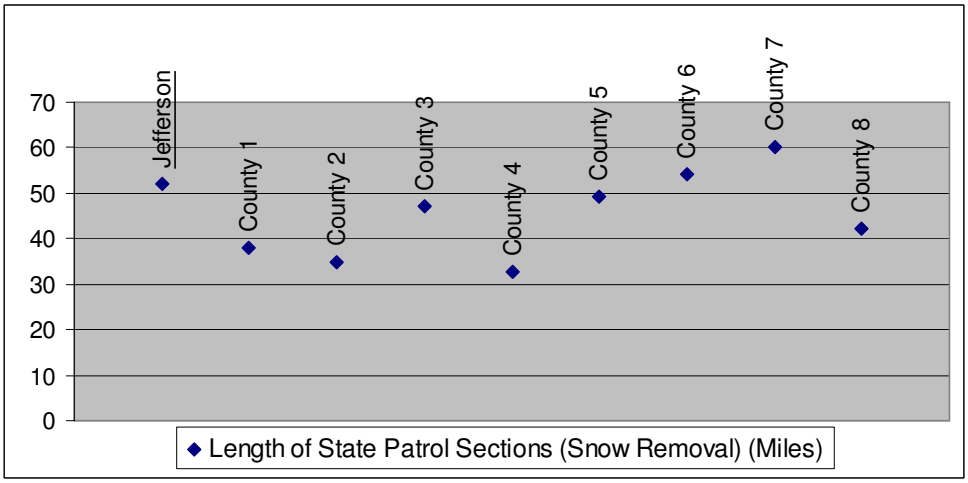
Jefferson
County 1
County 2
County 3
County 4
County 5
County 6
County 7
County 8
Number of County Patrol Sections (Snow Removal)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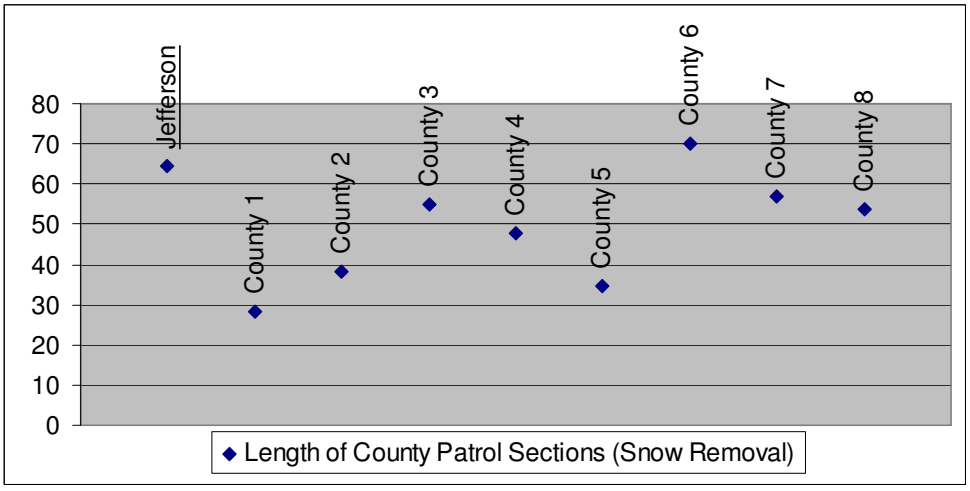
Jefferson
County 1
County 2
County 3
County 4
County 5
County 6
County 7
County 8
Length of State Patrol Sections (Snow Removal) (Miles)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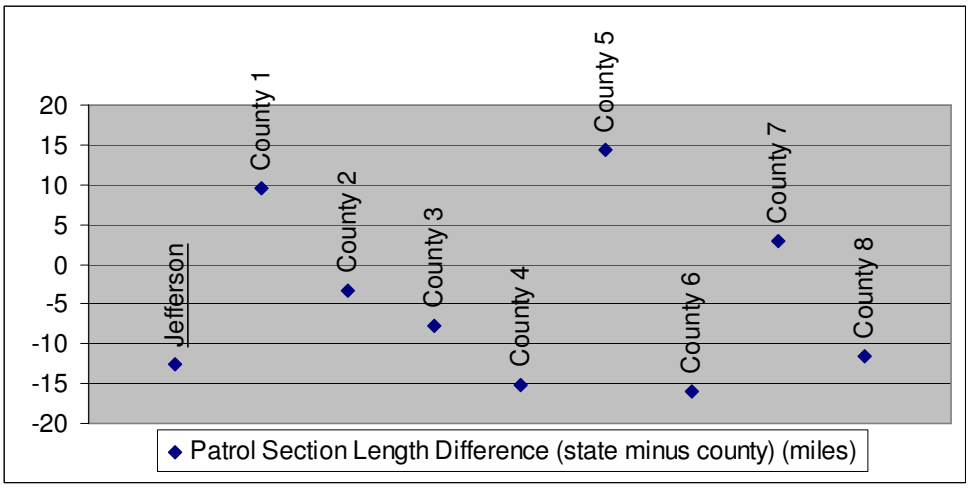
60
50
40
30
20
10
0
Jefferson
County 1
County 2
County 3
County 4
County 5
County 6
County 7
County 8
Length of County Patrol Sections (Snow Removal)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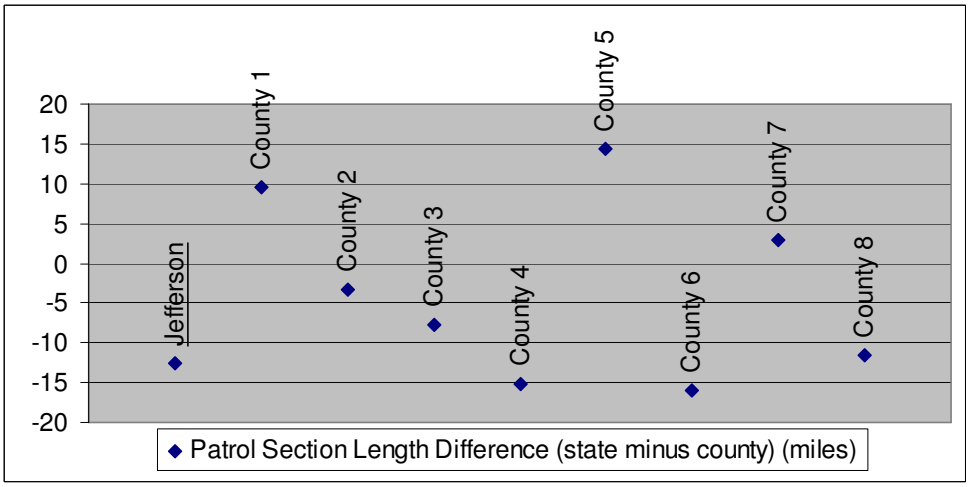
Jefferson
County 1
County 2
County 3
County 4
County 5
County 6
County 7
County 8
Patrol Section Length Difference (state minus county) (miles)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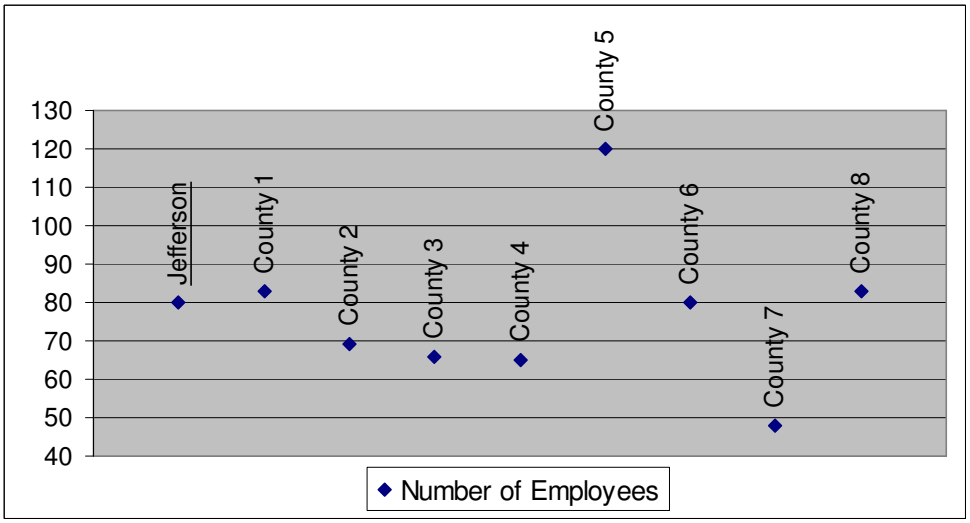
15
10
5
0
-5
-10
-15
-20
Jefferson
County 1
County 2
County 3
County 4
County 5
County 6
County 7
County 8
Patrol Section Length Difference (state minus county) (miles)


130
120
110
100
90
80
70
60
50
40
Jefferson
County 1
County 2
County 3
County 4
County 5
County 6
County 7
County 8
Number of Employees

COMPARATIVE ANALYSIS OF THE JEFFERSON COUNTY HIGHWAY SYSTEM

AUTHORIZED BY
JEFFERSON COUNTY

Comparative Analysis
Jefferson County Highway System

Introduction

Thomas R. Boguszewski is a registered professional engineer in the State of Wisconsin. He has 34 years of experience in highway transportation engineering, including 27 years at the county government level in the State of Wisconsin. His services were solicited by Virchow-Krause, Inc. to conduct an analysis of the Jefferson County Highway System and to compare the condition of that system with the systems of eight comparable counties. The counties chosen for comparison included: Calumet, Chippewa, Fond du Lac, Manitowoc, Sauk, Sheboygan, Washington, and Waupaca.

The services provided by the professional engineer were limited to gathering the available statistical information relative to pavement condition ratings using the WISLR System and the PASER pavement evaluation system. His charge was also to analyze the conformance of each county roadway system with current standards, and to compare the mileage of each system by functional classification. Finally, he was to provide a summarized qualitative assessment of the overall level of service of each of the eight comparable counties to that of Jefferson County.

Studies conducted by many transportation agencies, including the State of Wisconsin Department of Transportation indicate that pavement condition or quality of ride is most important factor to most motorists. For that reason, pavement condition will be the most critical factor in this analysis.

Standards for pavement, shoulder, and bridge widths for the County Trunk Highway Systems in the State of Wisconsin are contained in Chapter Trans 205 of the Wisconsin Administrative Code. In conducting the roadway system overall analysis, it was the conformance to these pavement and shoulder widths that carried the most weight; however, other items such as steepness of side slopes, drainage, signage, pavement marking, and vegetation maintenance were also considered.

Standards for pavement and shoulder widths as presented in Chapter Trans 205, are linked directly to their functional classification, and to the average daily traffic (ADT) carried by the roadway. A brief discussion of the highway functional classification system follows.

Functional Systems for Rural Areas

Rural roads consist of those facilities that are outside of small urban and urbanized areas. They are classified into four major systems: Principal arterials, minor arterial roads, major and minor collector roads, and local roads.

Rural Principal Arterial System

The rural principal arterial system consists of a connected rural network of continuous routes having the following characteristics:

Serve corridor movements having trip length and travel density characteristics indicative of substantial statewide or interstate travel.

Serve all, or virtually all, urban areas of 50,000 and over population and a large majority of those with population of 25,000 and over.

Provide an integrated network without stub connections except where unusual geographic or traffic flow conditions dictate

Rural Minor Arterial Road System

The rural minor arterial road system should, in conjunction with the principal arterial system, form a rural network having the following characteristics:

Link cities and larger towns (and other traffic generators, such as major resort areas, that are capable of attracting travel over similarly long distances) and form an integrated network providing interstate and inter-county service.

Be spaced at such intervals, consistent with population density, so that all developed areas of the State are within a reasonable distance of an arterial highway.

Provide (because of the two characteristics defined immediately above) service to corridors with trip lengths and travel density greater than those predominantly served by rural collector or local systems. Minor arterials therefore constitute routes whose design should be expected to provide for relatively high overall travel speeds, with minimum interference to-through movement.

Rural Collector Road System

The rural collector routes generally serve travel of primarily intra-county rather than statewide importance and constitute those routes on which (regardless of traffic volume) predominant travel distances are shorter than on arterial routes. Consequently, more moderate speeds may be typical, on the average. In order to define more clearly the characteristics of rural collectors, this system should be sub-classified according to the following criteria:

Major Collector Roads -These routes should: (1) provide service to any county seat not on an arterial route, to the larger towns not directly served by the higher systems, and to other traffic generators of equivalent intra-county importance, such as consolidated schools, shipping points, county parks, important mining and agricultural areas, etc.; (2) link these places with nearby larger towns or cities, or with routes of higher classification; and (3) serve the more important intra-county travel corridors.

Minor Collector Roads -These routes should: (1) be spaced at intervals, consistent with population density, to collect traffic from local roads and bring all developed areas within a reasonable distance of a collector road; (2) provide service to the remaining smaller communities; and (3) link the locally important traffic generators with their rural hinterland.

Rural Local Road System

The rural local road system should have the following characteristics: (1) Serve primarily to provide access to adjacent land; and (2) provide service to travel over relatively short distances as compared to collectors or other higher systems. Local roads will, of course, constitute the rural mileage not classified as part of the principal arterial, minor arterial, or collector systems.

Functional Systems in Urbanized Areas

The four functional systems for urbanized areas are urban principal arterials, minor arterial streets, collector streets, and local streets. The differences in the nature and intensity of development between rural and urban areas cause these systems to have characteristics that are somewhat different from the correspondingly named rural systems.

Urban Principal Arterial System

In every urban environment there exists a system of streets and highways, which can be identified as unusually significant to the area in which it lies in terms of the nature, and composition of travel it serves. In smaller urban areas (under 50,000) these facilities may be very limited in number and extent and their importance may be primarily derived from the service provided to travel passing through the area. In larger urban areas their importance also derives from service to rural oriented traffic, but equally or even more important, from service for major movements within these urbanized areas.

This system of streets and highways is the urban principal arterial system and should serve the major centers of activity of a metropolitan area, the highest traffic volume corridors, and the longest trip desires; and should carry a high proportion of the total urban area travel on a minimum of mileage. The system should be integrated, both internally and between major rural connections.

The principal arterial system should carry the major portion of trips entering and leaving the urban area, as well as the majority of through movements desiring to bypass the central city. In addition, significant intra-area travel, such as between central business districts and outlying residential areas, between major inner city communities, or between major suburban centers, should be served by this system. Frequently the principal arterial system will carry important intra-urban as well as intercity bus routes. Finally, this system in small urban and urbanized areas should provide continuity for all rural arterials, which intercept the urban boundary.

Because of the nature of the travel served by the principal arterial system, almost all fully and partially controlled access facilities will be part of this functional system. However, this system is not restricted to controlled access routes. In order to preserve the identification of controlled access facilities, the principal arterial system is stratified as follows: (1) Interstate, (2) other freeways and expressways, and (3) other principal arterials (with no control of access).

The spacing of urban principal arterials will be closely related to the trip-end density characteristics of particular portions of the urban areas. while no firm spacing rule can be established which will apply in all, or even most circumstances, the spacing of principal arterials (in larger urban areas) may vary from less than one mile in the highly developed central business areas to five miles or more in the sparsely developed urban fringes.

For principal arterials, the concept of service to abutting land should be subordinate to the provision of travel service to major traffic movements. It should be noted that only facilities within the "other principal arterial" system are capable of providing any direct access to adjacent land, and such service should be purely incidental to the primary functional responsibility of this system.

Urban Minor Arterial Street System

The minor arterial street system should interconnect with and augment the urban principal arterial system and provide service to trips of moderate length at a somewhat lower level of travel mobility than principal arterials. This system also distributes travel to geographic areas smaller than those identified with the higher system.

The minor arterial street system includes all arterials not classified as a principal and contains facilities that place more emphasis on land access than the higher system, and offer a lower level of traffic mobility. Such facilities may carry local bus routes and provide intra-community continuity, but ideally should not penetrate identifiable neighborhoods. This system should include urban connections to rural collector roads where such connections have not been classified as urban principal arterials.

The spacing of minor arterial streets may vary from 1/8 - 1/2 mile in the central business district to 2 - 3 miles in the suburban fringes, but should normally be not more than 1 mile in fully developed areas.

Urban Collector Street System

The collector street system provides both land access service and traffic circulation within residential neighborhoods, commercial and industrial areas. It differs from the arterial system in that facilities on the collector system may penetrate residential neighborhoods, distributing trips from the arterials through the area to the ultimate destination. Conversely, the collector street also collects traffic from local streets in residential neighborhoods and channels it into the arterial system. In the central business district, and in other areas of like development and traffic density, the collector system may include the street grid which forms a logical entity for traffic circulation.

Urban Local Street System

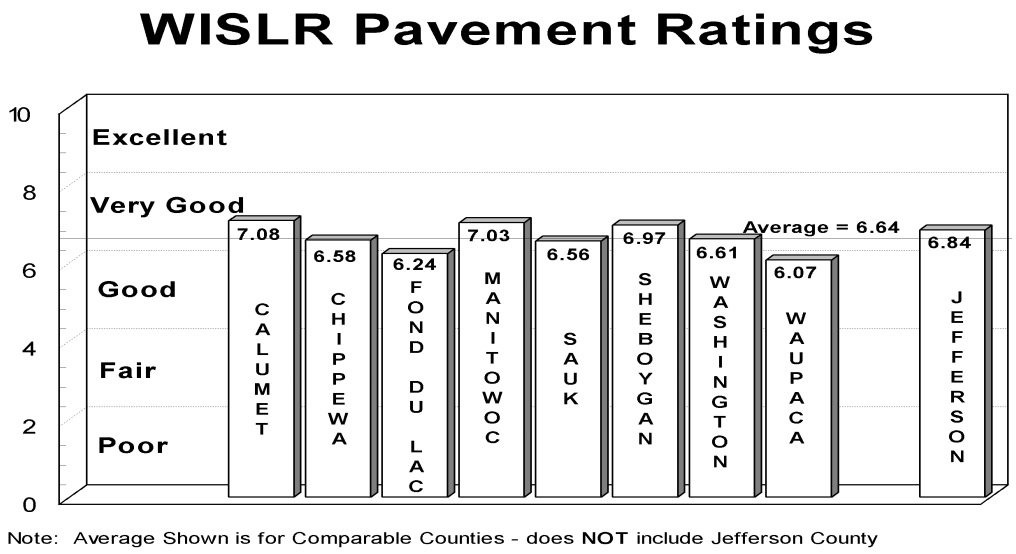
The local street system comprises all facilities not on one of the higher systems. It serves primarily to provide direct access to abutting land and access to the higher order systems. It offers the lowest level of mobility and usually contains no bus routes. Service to through, traffic movement usually is deliberately discouraged.

Summary Of Results

Pavement Conditions

- The Jefferson County Highway System overall pavement condition ranked fourth among the nine counties.
- The overall pavement condition of the Jefferson County Highway System equals 6.84 on a scale of zero to ten, with ten being a newly constructed pavement. This rating was greater than the average of 6.64 for the eight comparable counties.

The results are shown graphically in the following chart:

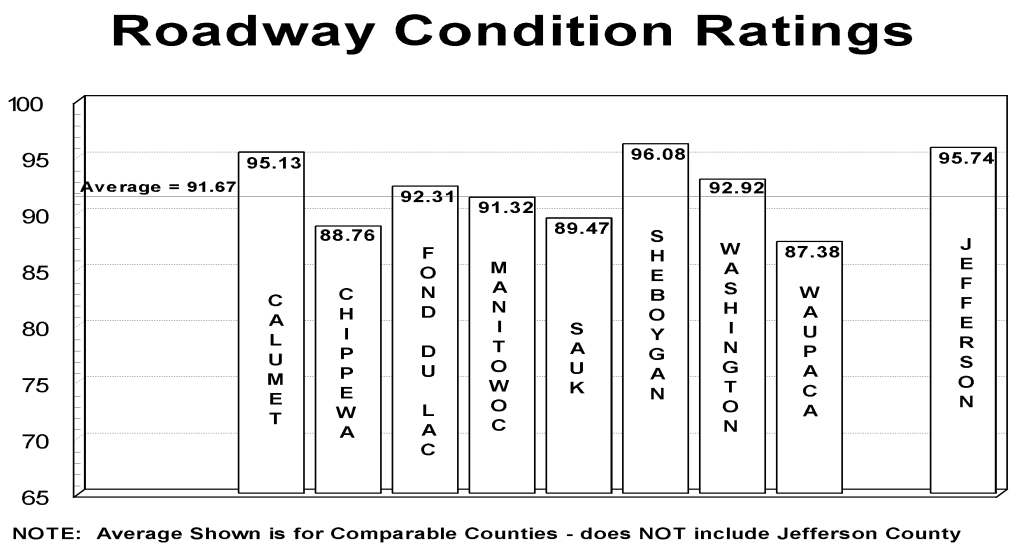


Note: Average Shown is for Comparable Counties - does **NOT** include Jefferson County

Roadway Conditions

- The overall condition of the Jefferson County Highway System ranked second among the nine counties. Note that pavement condition was NOT included in the roadway condition rating.
- The overall condition of the Jefferson County Highway System equals 95.74 on a scale that ranged from 60 to 100, a description of the rating system used will be detailed in the Process section of this report.
- This rating was greater than the average of 91.67 for the eight comparable counties.

The results are shown graphically in the following chart:



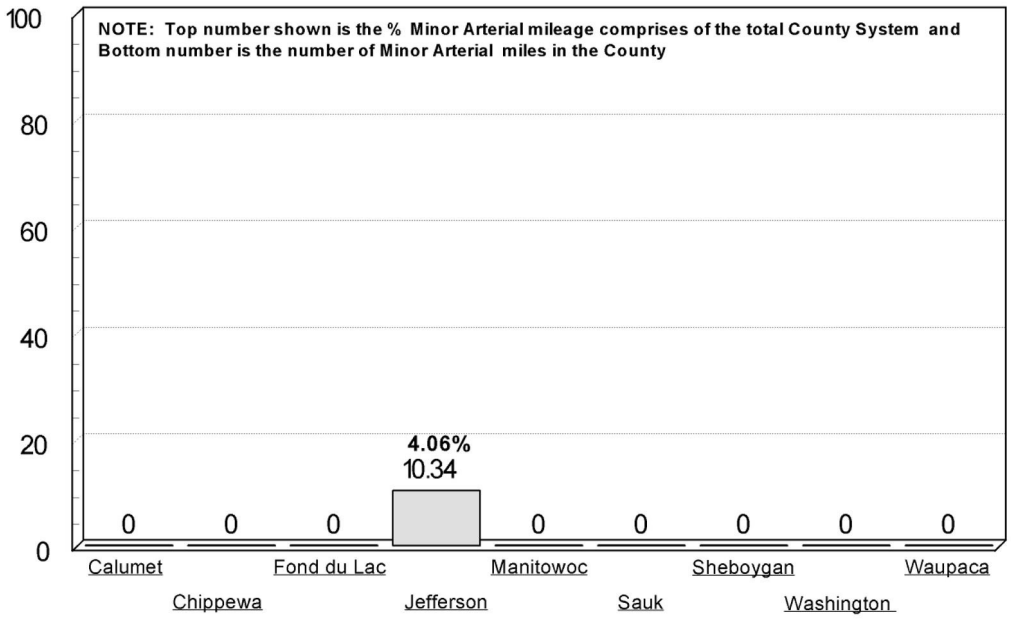
FUNCTIONAL CLASSIFICATION

To relay the information regarding the functional classification comparison, a photo will be displayed as an example of each of the eight categories. The data regarding functional classification is displayed two ways, first, a bar chart will be provided for each of the eight functional classifications, showing the number of miles and the percentage of the total system for each of the nine study counties, and secondly, a pie chart will be presented for each county showing the make-up of their roadway system by functional classification

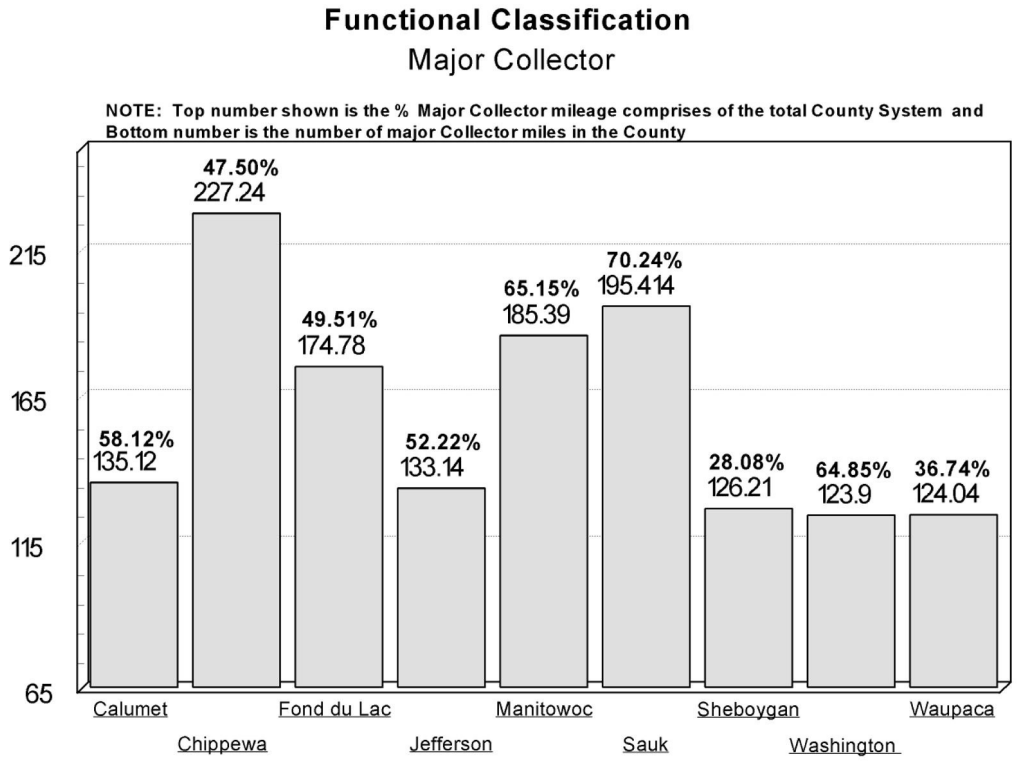
MINOR ARTERIAL

Functional Classification

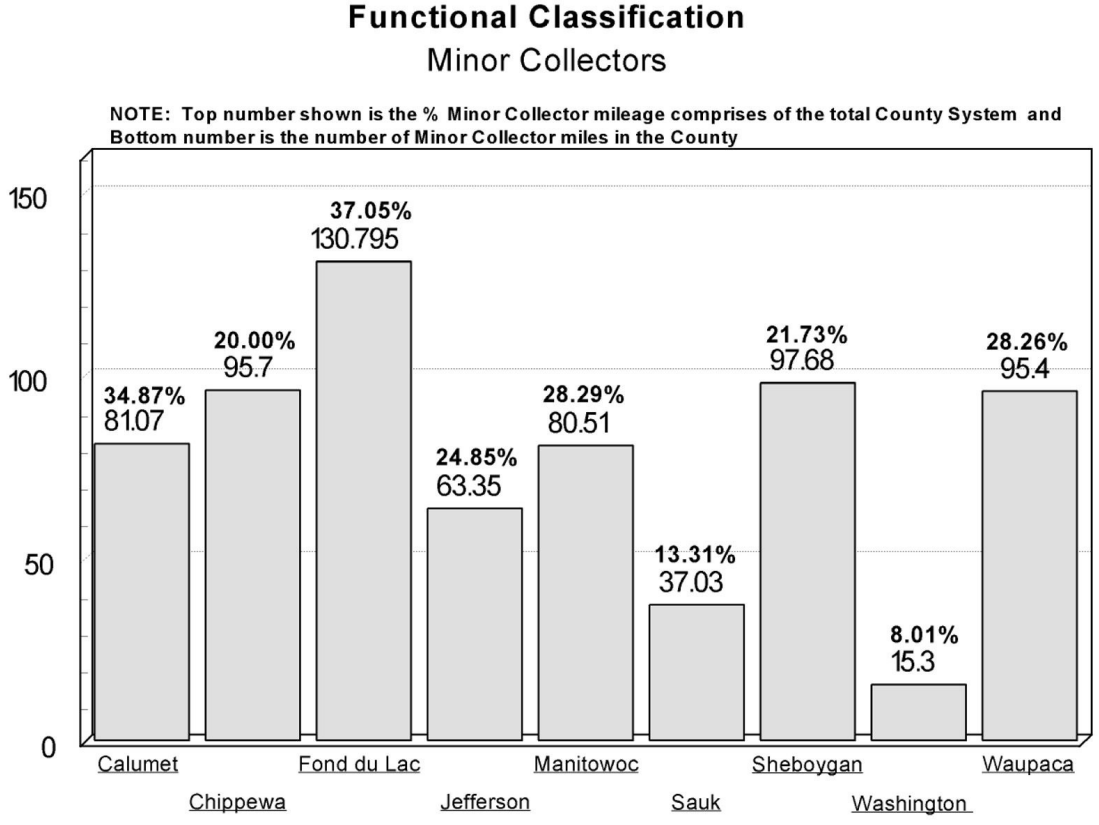
Minor Arterials



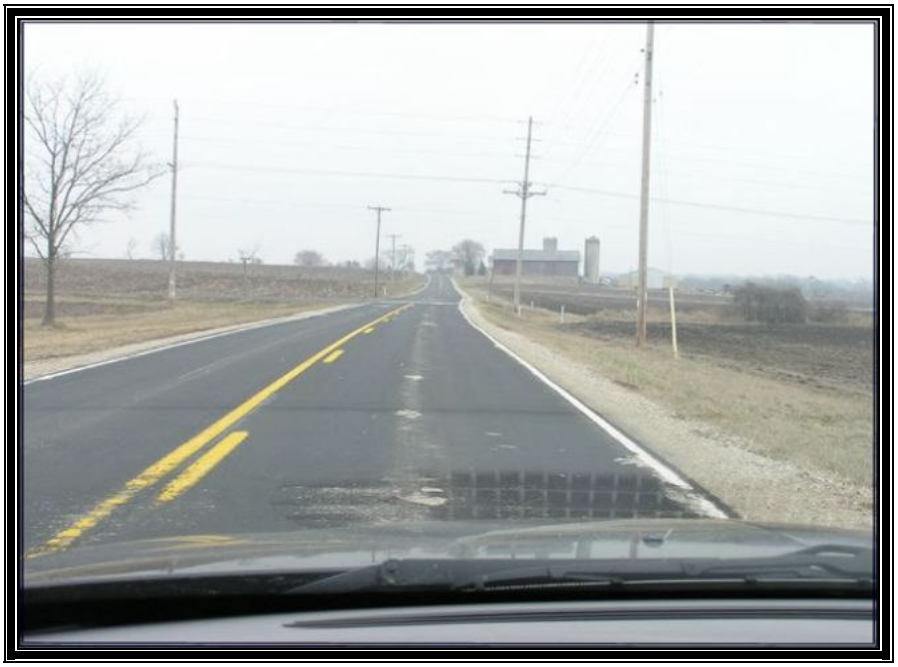
MAJOR COLLECTORS



MINOR COLLECTOR

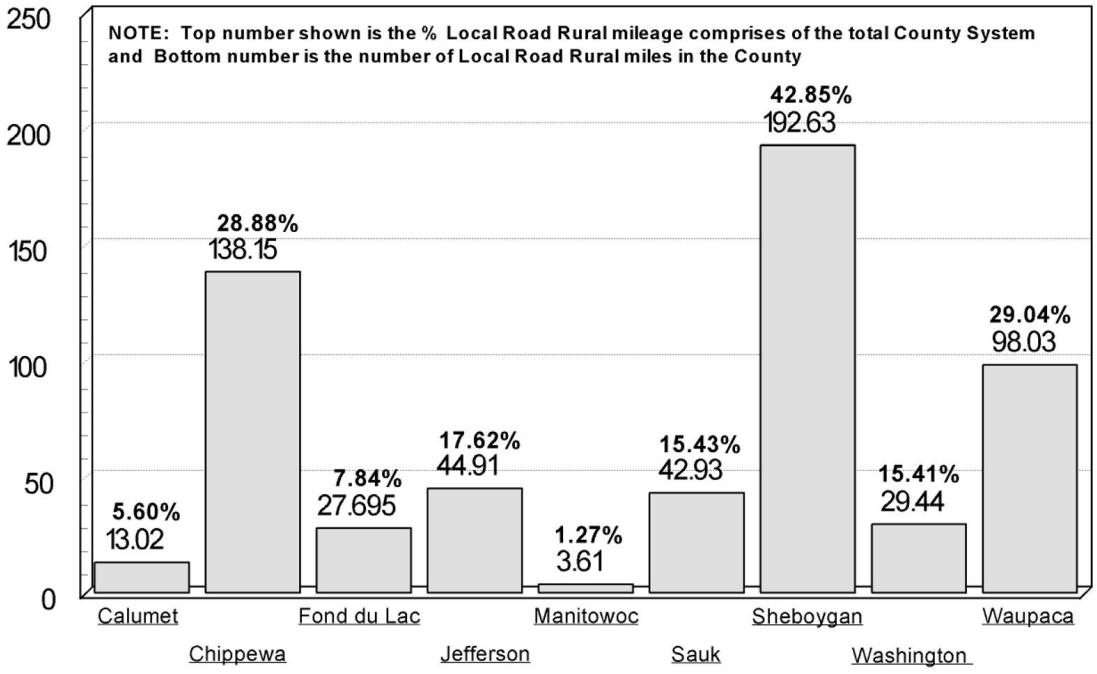


LOCAL ROAD – RURAL



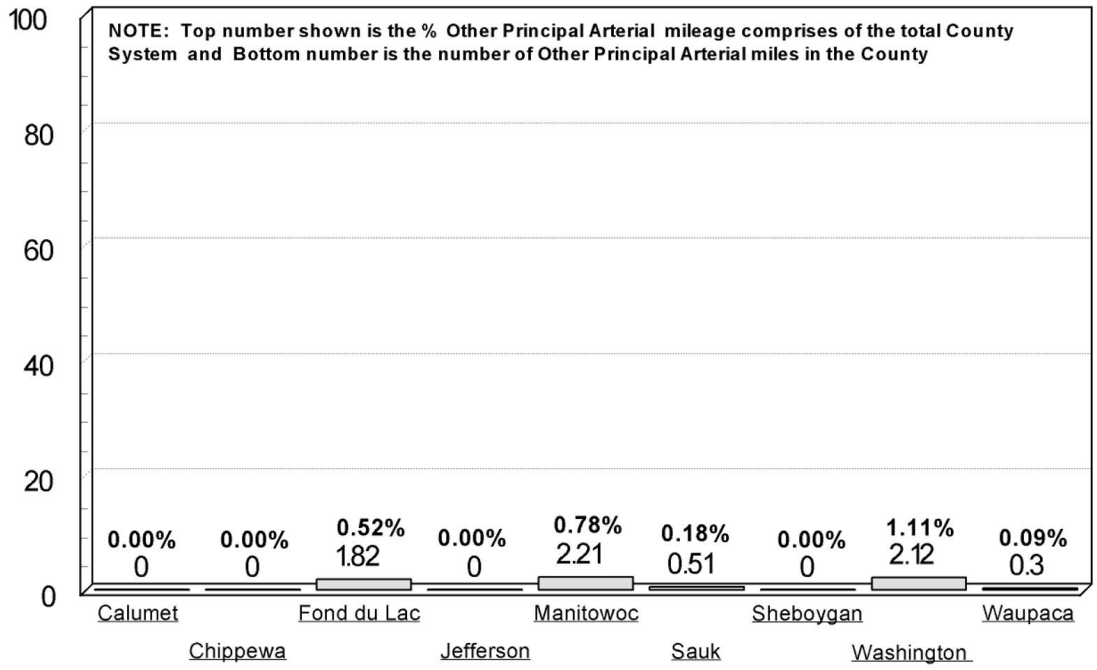
Functional Classification

Local Road - Rural

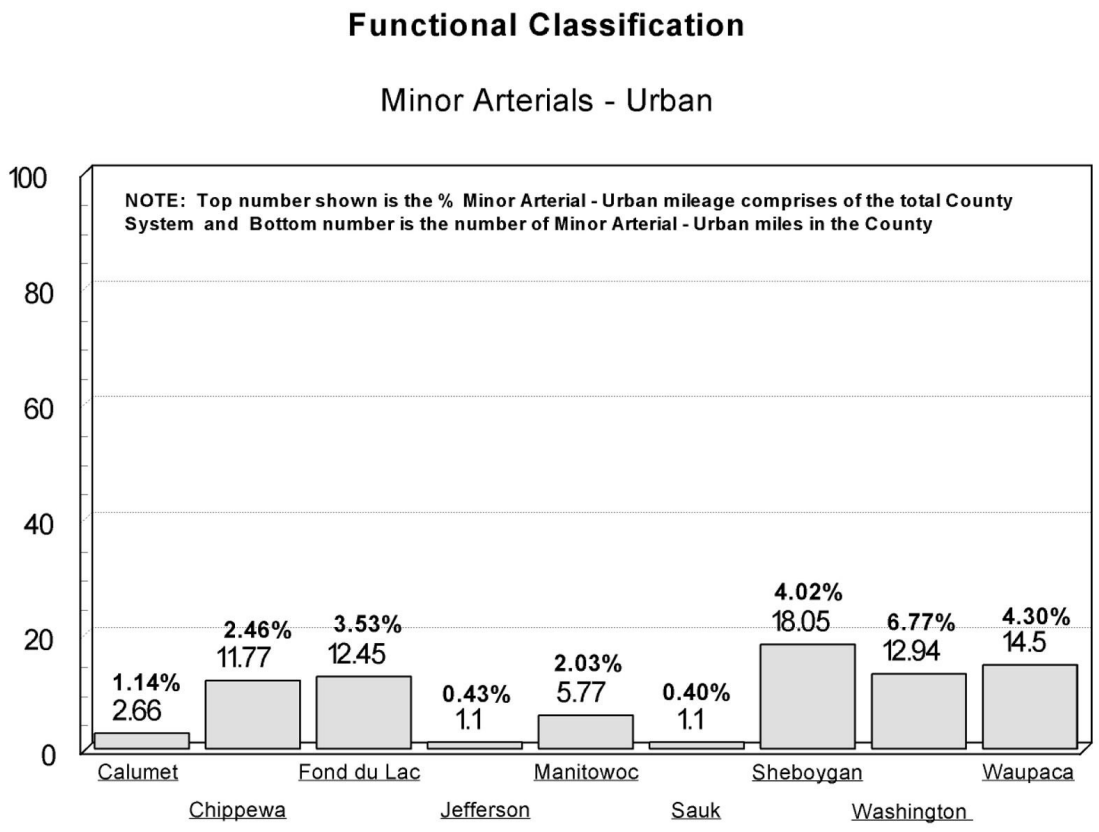


Functional Classification

Other Principal Arterials



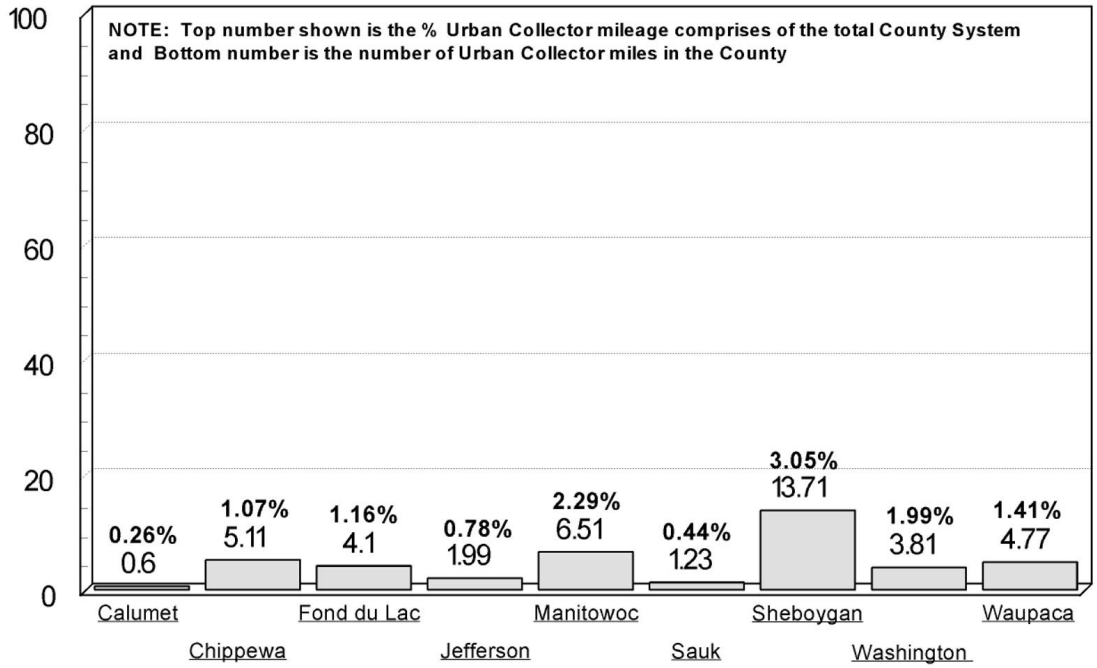
MINOR ARTERIALS- URBAN



URBAN COLLECTOR

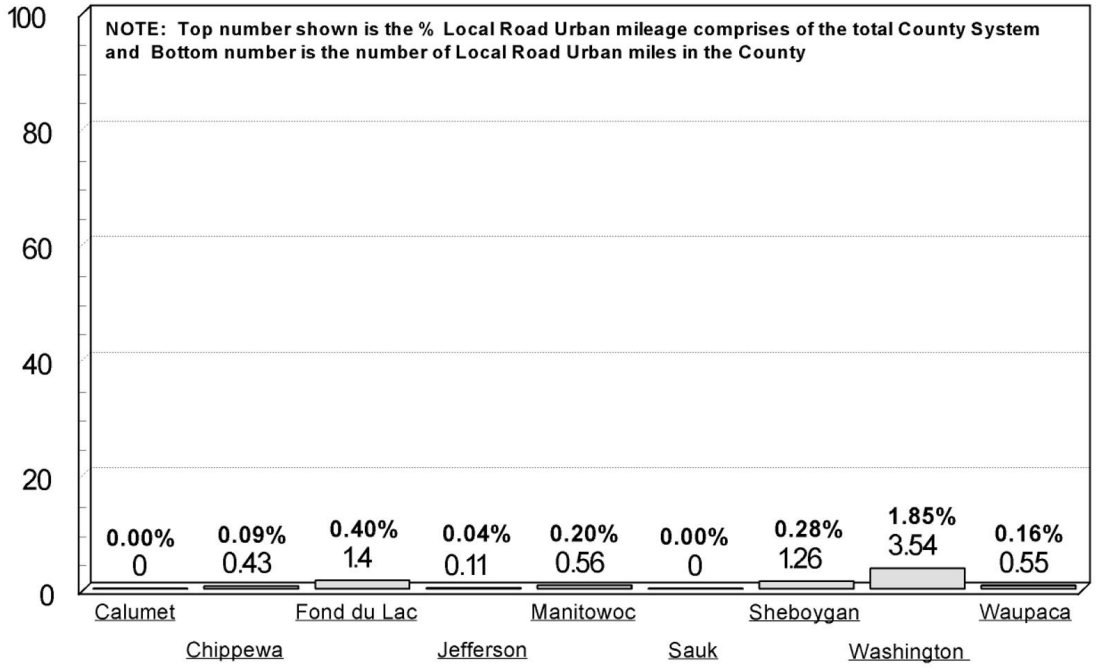
Functional Classification

Urban Collectors



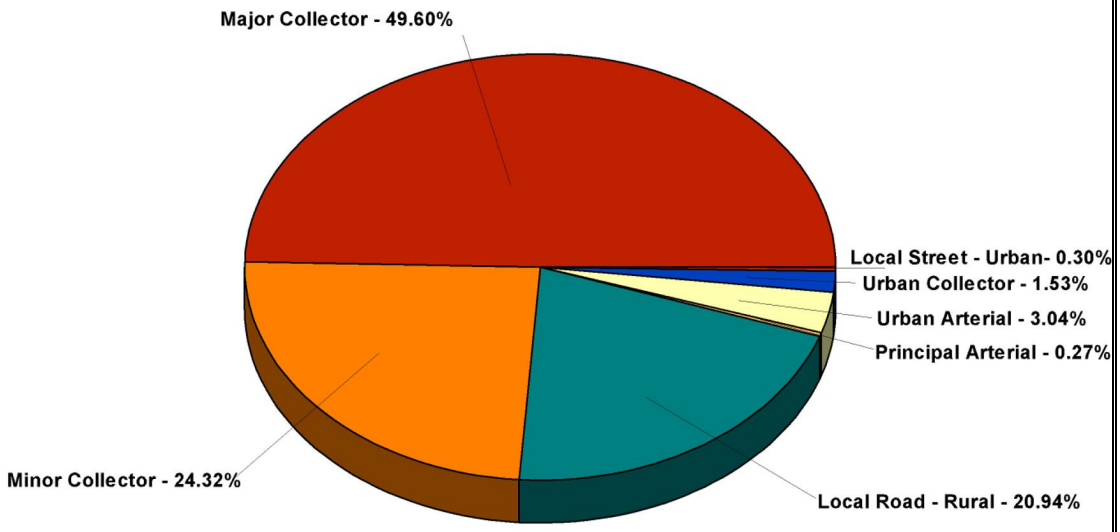
Functional Classification

Local Road - Urban



Functional Classification

Total - Eight Comparable Counties

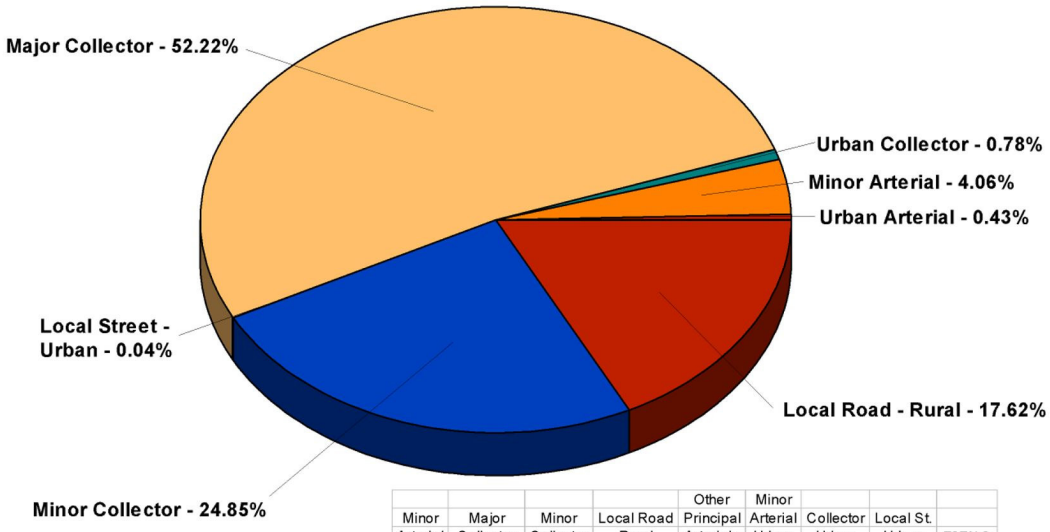


Based on 2,605 Miles

Minor Arterial	Major Collector	Minor Collector	Local Road Rural	Other Principal Arterials	Minor Arterial Urban	Collector Urban	Local St. Urban
0	1292.09	633.485	545.505	6.96	79.24	39.84	7.74

Jefferson County Highway System

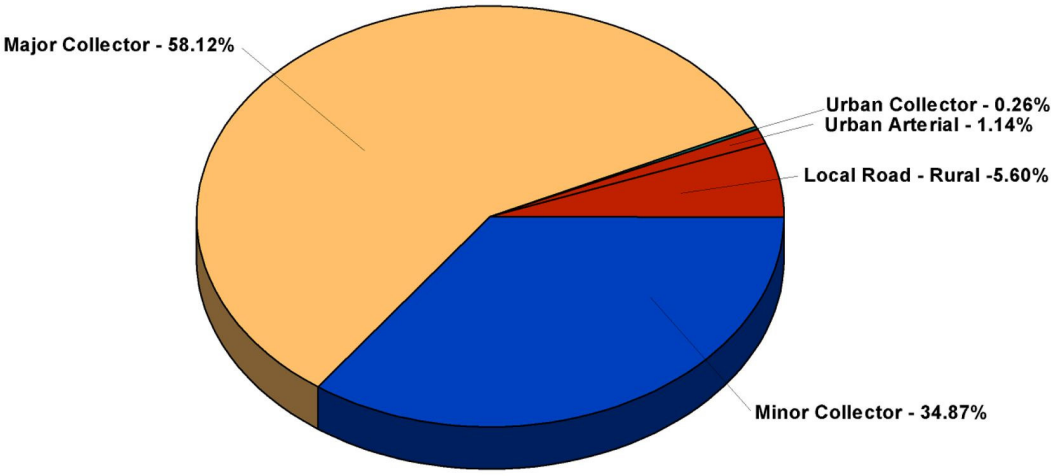
Functional Classification



Minor Arterial	Major Collector	Minor Collector	Local Road Rural	Other Principal Arterials	Minor Arterial Urban	Collector Urban	Local St. Urban	TOTALS
10.34	133.14	63.35	44.91	-	1.10	1.99	0.11	254.94

Calumet County Highway System

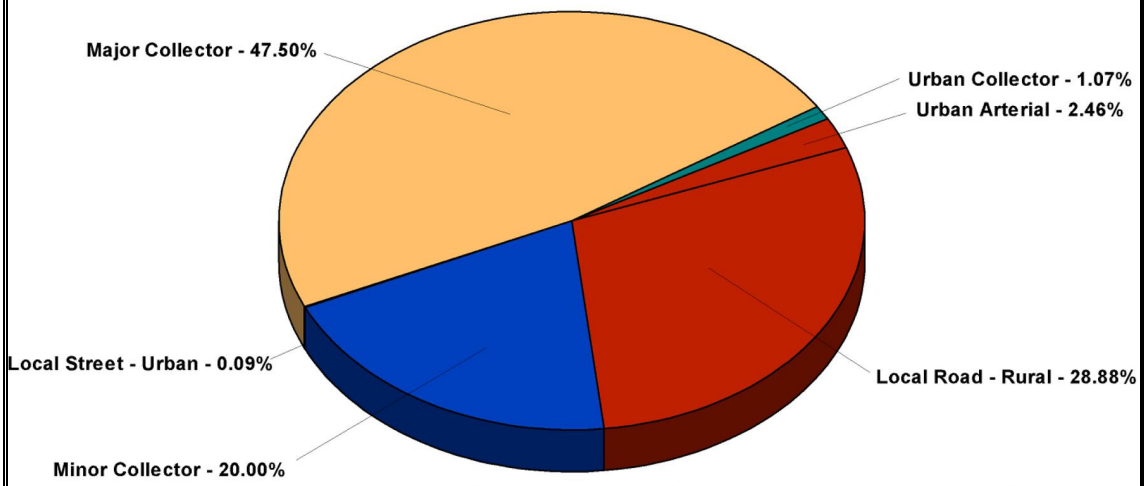
Functional Classification



Minor Arterial	Major Collector	Minor Collector	Local Road Rural	Other Principal Arterials	Minor Arterial Urban	Collector Urban	Local St. Urban	TOTALS
-	135.12	81.07	13.02	-	2.66	0.60	-	232.47

Chippewa County Highway System

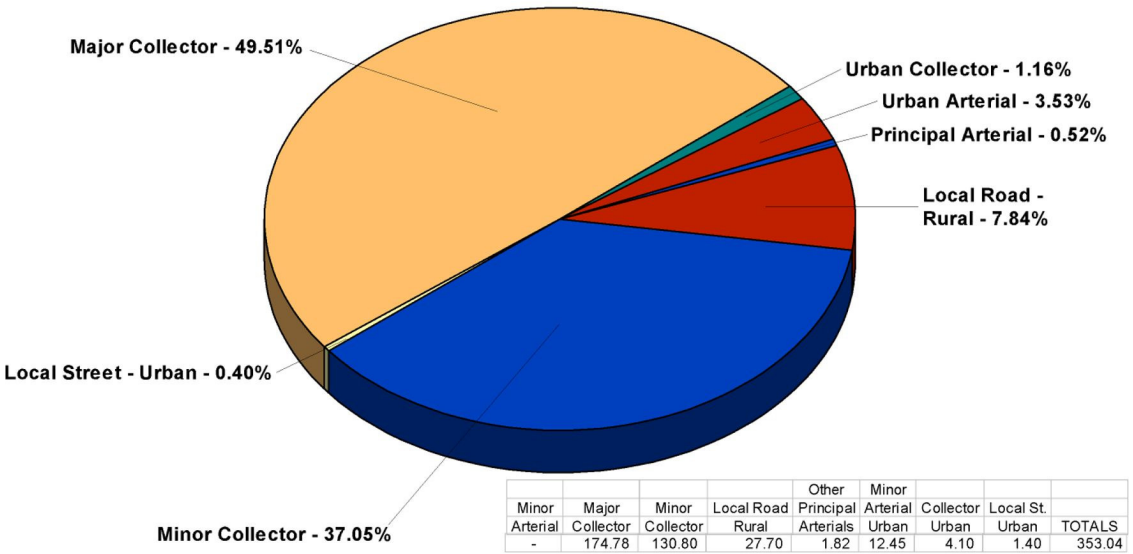
Functional Classification



Minor Arterial	Major Collector	Minor Collector	Local Road Rural	Other Principal Arterials	Minor Arterial Urban	Collector Urban	Local St. Urban	TOTALS
-	227.24	95.70	138.15	-	11.77	5.11	0.43	478.4

Fond du Lac County Highway System

Functional Classification

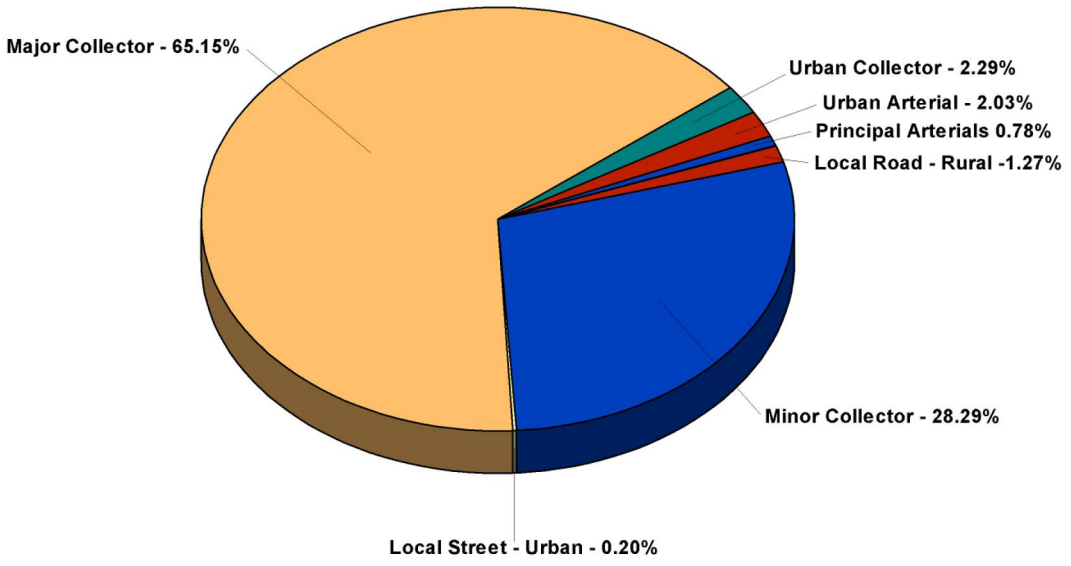


Minor Arterial	Major Collector	Minor Collector	Local Road Rural	Other Principal Arterials	Minor Arterial Urban	Collector Urban	Local St. Urban	TOTALS
-	174.78	130.80	27.70	1.82	12.45	4.10	1.40	353.04

Manitowoc County Highway System

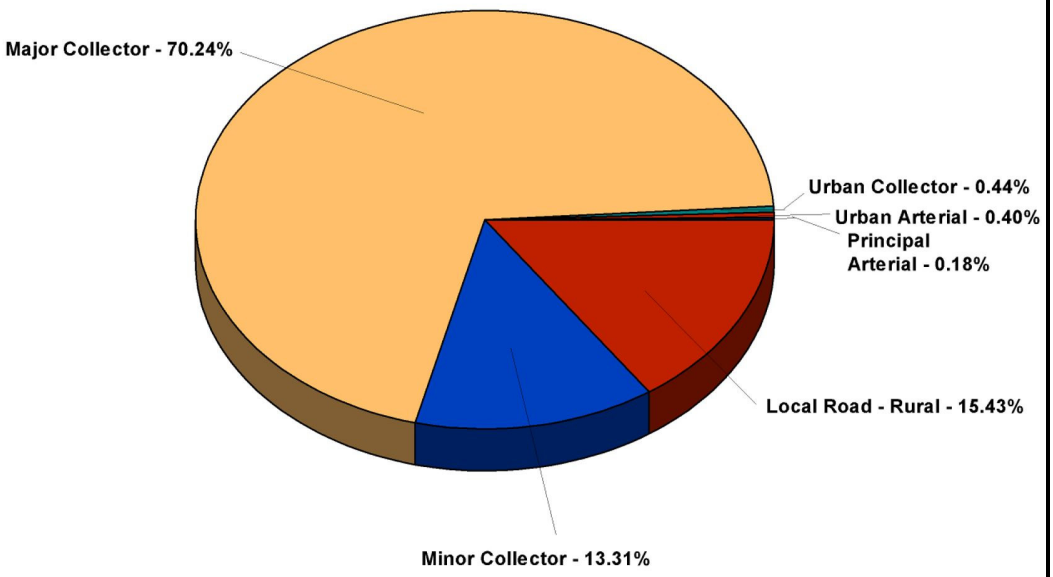
Functional Classification

Minor Arterial	Major Collector	Minor Collector	Local Road Rural	Other Principal Arterials	Minor Arterial Urban	Collector Urban	Local St. Urban	TOTALS
-	185.39	80.51	3.61	2.21	5.77	6.51	0.56	284.56

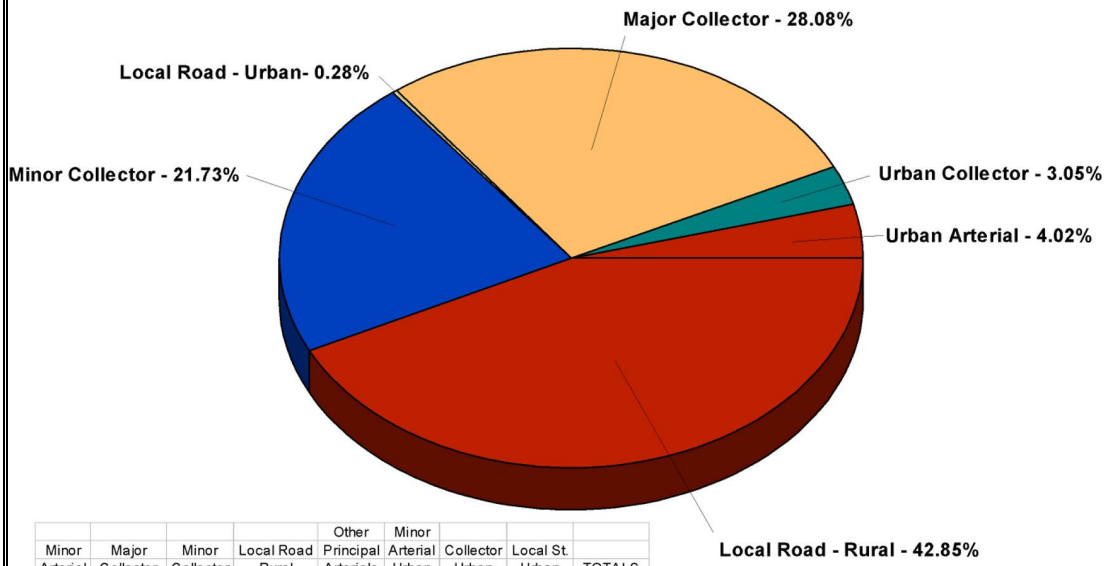


Sauk County Highway System
Functional Classification

Minor Arterial	Major Collector	Minor Collector	Local Road Rural	Other Principal Arterials	Minor Arterial Urban	Collector Urban	Local St. Urban	TOTALS
-	195.41	37.03	42.93	0.51	1.10	1.23	-	278.214



Sheboygan County Highway System
Functional Classification

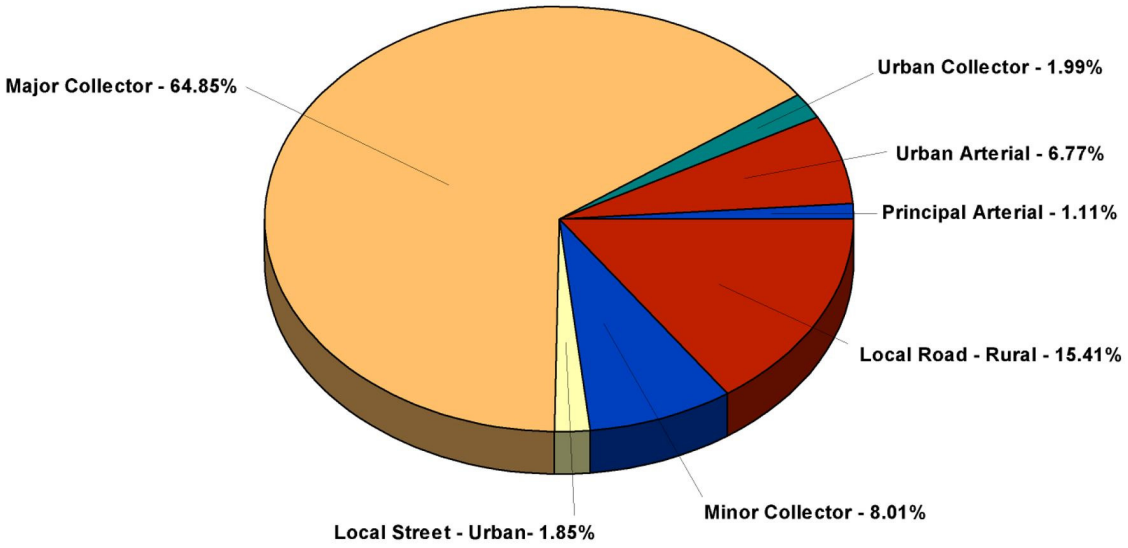


Minor Arterial	Major Collector	Minor Collector	Local Road Rural	Other Principal Arterials	Minor Arterial Urban	Collector Urban	Local St. Urban	TOTALS
-	126.21	97.68	192.63	-	18.05	13.71	1.26	449.54

Washington County Highway System

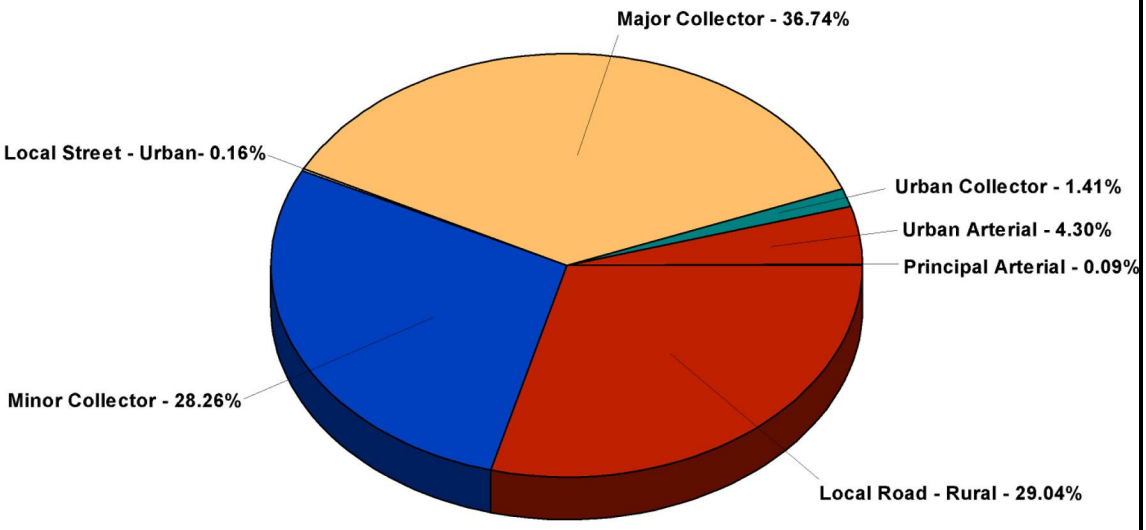
Functional Classification

Minor Arterial	Major Collector	Minor Collector	Local Road Rural	Other Principal Arterials	Minor Arterial Urban	Collector Urban	Local St. Urban	TOTALS
-	123.90	15.30	29.44	2.12	12.94	3.81	3.54	191.05



Waupaca County Highway System

Functional Classification



Minor Arterial	Major Collector	Minor Collector	Local Road Rural	Other Principal Arterials	Minor Arterial Urban	Collector Urban	Local St. Urban	TOTALS
-	124.04	95.40	98.03	0.30	14.50	4.77	0.55	337.59

OPINION

Based on 34 years of highway transportation experience, it is my professional opinion that taking into consideration PASER Pavement Ratings, overall roadway conditions, and functional classification mileage, the nine comparable counties rank in the following order:

1. Sheboygan
2. Jefferson
3. Calumet
4. Washington
5. Fond du Lac
6. Manitowoc
7. Sauk
8. Chippewa
9. Waupaca

Process

Information Gathering

The State of Wisconsin Department of Transportation (WisDOT) has developed an extensive local road database. This database is the Wisconsin Information System for Local Roads and is known as WISLR. The author requested Pavement Condition Rating and Functional Classification data for the nine comparable counties from WisDOT. This information was provided in EXCEL spreadsheet format, with the exception of Pavement Condition Rating data for Chippewa, Fond du Lac and Jefferson counties, which was not available. This information was then requested from and provided by the respective county highway commissioners.

The total length of the nine counties used in this comparison is 2,821.01 miles, and it was reported in 2,746 segments. Each roadway segment is consistent throughout its length as far as pavement width, shoulder width, and pavement condition. Roadway segments varied in length from as little as 0.01 miles to segments in excess of five miles long.

Selection of Random Pavement Segments

It was determined that a 5% sample size was sufficient to draw reasonable conclusions about the data and the condition of the Jefferson County Highway System, when compared to similar counties. Segments used for comparison were determined on a county-by-county basis, rather than taking a random sample of the 2,746 segments. To select the segments to be used for the field verification, each segment was assigned a random number, using the Excel Spreadsheet random number function. The roadway segments were then sorted by the random number, in ascending order. The lengths of each segment were added accumulatively, and the random segments where those beginning with the lowest random number generated and ending with the segment whose cumulative length exceeded 5% of the total mileage in the county. A total of 102 segments totaling 174.96 miles, representing 6.202% of the total mileage was field reviewed and analyzed.

Field Review of Random Segments

Each of the 102 random segments was driven at least once in each direction. While driving, the engineer recorded notes documenting the conditions of the various criteria that were to be used in rating the roadway overall condition. These items included steepness of side slopes, condition of shoulders, drainage, signing, pavement marking, and vegetation maintenance. Regarding shoulder condition, attention was directed at shoulder slope, and edge drop-off. Particular attention was paid to items that could have a potential negative impact on roadway safety; i.e. signing not in conformance with the Manual on Uniform Traffic Control Devices (signs missing or misused), guardrail either missing or not meeting standards, obstacles within the right of way, etc. Pavement and shoulders widths were measured to verify compliance with data provided by WisDOT. Over 400 photographs were taken to document all roadway characteristics.

In addition to the roadway analysis, field visits were used to verify the Pavement Rating Data that had been provided. The PASER system was used as the basis of comparison for pavement condition ratings. The PASER rating system is rather simple and straightforward; however, it is still a subjective system. In the opinion of the engineer, the majority of segments were accurately and consistently rated. For the relatively few segments that the author was not in agreement with, most segments would have warranted a higher, not lower rating. In the opinion of the author, the data that was provided by WisDOT and the counties is a valid basis for comparison. A copy of the PASER pavement-rating manual will be provided as a supplement to this report.

Comparative Analysis

The analysis of pavement ratings was simple and straightforward. A weighted average pavement rating was computed for each of the nine counties, and for comparison, the weighted average for all roadway segments in the eight comparable counties was also computed.

The overall roadway condition analysis was also subjective. The engineer established a numerical rating formula based on compliance of pavement and shoulder widths to standards, along with condition of side slopes, drainage, pavement marking, signage, and vegetation maintenance. The criteria are provided as Appendix D of this report.

APPENDIX D

ROADWAY ANALYSIS CRITERIA

CROSS SECTION – CONFORMANCE WITH STANDARDS (60%)		
CRITERIA		
MEETS STANDARDS FOR DRIVING LANE AND SHOULDER WIDTH	100	Points
DEDUCTION FOR EACH FOOT NARROWER THAN LANE WIDTH STANDARD	-10	Points
SHOULDERS IN GOOD CONDITION & MEETING WIDTH	-0	Points
SUBSTANDARD SHOULDER WIDTH	-5	Points
SUBSTANDARD SHOULDER CONDITON	-5	Points
NORMAL SLOPES	0	Points
STEEP SLOPES - ENTIRE SECTION	-10	Points
STEEP SLOPES - PARTIAL SECTION	-5	Points
DRAINAGE (10%)		
GOOD DRAINAGE	100	Points
FAIR DRAINAGE	85	Points
POOR DRAINAGE	70	Points
SIGNING (10%)		
ALL SIGNS IN GOOD CONDITON	100	Points
SOME SIGNS IN GOOD CONDITION BUT LEANING	90	Points
SOME SIGNS IN FAIR CONDITION	80	Points
MISSING SIGNS OR SIGNS NOT IN ACCORDANCE W/ MUTCD	70	Points
PAVEMENT MARKING (10%)		
ALL C/L & E/L IN GOOD CONDITON	100	Points
C/L IN GOOD CONDITION & E/L IN FAIR CONDITON	90	Points
C/L IN GOOD CONDITION & E/L IN POOR CONDITION OR MISSING	80	Points
ALL C/L & E/L IN FAIR CONDITON	70	Points
C/L IN FAIR CONDITION & E/L IN POOR CONDITION OR MISSING	60	Points
C/L & E/L IN POOR CONDITION	50	Points
VEGETATION MAINTENANCE (10%)		
ALL VERY GOOD TO EXCELLENT	100	Points
ALL GOOD	90	Points
MOST GOOD WITH SOME WOODY VEGETATION	80	Points
FAIR - MUCH WOODY VEGETATION IN R/W	70	Points
POOR - WOODY VEGETATION - POSING A SAFETY HAZARD	60	Points

Appendix E

SUMMARY

Jefferson County, Highway Department
Operations Review Questionnaire (March 2004)

# of Respondents: **15 out of 25 (60%)**

1. Does the County Highway Department currently perform services for your city, village, or township? If no, under what conditions would your township/village consider utilizing the County Highway Department's services in the future?

- ***Town of Cold Spring:*** Yes.
- ***Town of Farmington:*** Yes.
- ***Town of Hebron:*** Yes.
- ***Town of Lake Mills:*** Yes.
- ***Town of Milford:*** Yes.
- ***Town of Oakland:*** Yes.
- ***Town of Palmyra:*** Yes.
- ***Town of Sumner:*** Yes.
- ***Town of Waterloo:*** Yes.
- ***Village of Palmrya:*** Yes.
- ***City of Fort Atkinson:*** No. City had used County for chip sealing and pulverizing/resurfacing projects. The City has changed from chip sealing to slurry sealing and now bids this work out. The pulverizing/resurfacing project was done using County forces on a joint City/Township project.
- ***City of Jefferson:*** Yes.
- ***City of Lake Mills:*** No. Seal coating, Pulverizing, Paving, Aggregate, Mechanic Work.
- ***City of Waterloo:*** Yes.
- ***City of Whitewater:*** Yes.

2. If yes to question one, what services does the County currently provide to your city/township/village?

Road Maintenance X, X, X, X, X, X, X, X, X, Winter Maintenance X, X, X, X, X, X, X, Culvert Repair X, X, X, X, X, X, Brushing X, X, X, X, X, Road Reconstruction X, X, X, X, X, X, X, X, X, Other

- ***Town of Cold Spring:*** Road Maintenance, Winter Maintenance, Culvert Repair, Brushing, Road Reconstruction.
- ***Town of Farmington:*** Road Maintenance, Culvert Repair, Brushing, Road Reconstruction. We use the County for sealcoating in our maintenance of roads also. We like the way they can do ditch repairs and cleaning from the roadway not impeding on private property and no damage to road, attributing this to the equipment they have, rubber tired hoe. In construction they have done overlays reclaiming and paving, also parking lot rehab. Other services would be some striping, estimating, and knowledge of how some projects could be done.
- ***Town of Hebron:*** Road Maintenance, Winter Maintenance, Culvert Repair, Road Reconstruction, Mowing Roadsides.
- ***Town of Lake Mills:*** Road Maintenance, Winter Maintenance, Brushing, Road Reconstruction.
- ***Town of Milford:*** Road Maintenance, Road Reconstruction.
- ***Town of Oakland:*** Culvert Repair, Road Reconstruction.
- ***Town of Palmyra:*** Road Maintenance, Winter Maintenance, Culvert Repair, Brushing, Road Reconstruction.
- ***Town of Sumner:*** Road Maintenance, Winter Maintenance, Culvert Repair, Brushing, Road Reconstruction.
- ***Town of Waterloo:*** Road Maintenance, Road Reconstruction.
- ***Village of Palmyra:***Roadside mowing. Also purchase gasoline/diesel fuel through the County Highway Department.
- ***City of Jefferson:*** Road Maintenance.
- ***City of Waterloo:*** Winter Maintenance.
- ***City of Whitewater:*** Winter Maintenance, Road Reconstruction, Construct some parking lots.

3. What is your city/township/village's level of satisfaction with regard to the services provided by the County Highway Department?

Poor____, Fair_ X, X _, Good_ X, X, X, X, X, X, X _, Excellent_ X, X, X, X, X, X _.

4. What is the level of satisfaction for the value (cost vs. services) the residents of your city/township/village receive from the services provided by the County Highway Department?

Poor____, Fair_ X, X _, Good_ X, X, X, X, X, X, X, X, X _, Excellent_ X, X, X, X _.

5. What is your city/township/village's level of satisfaction for promptness of services provided by the Jefferson County Highway Department?

Poor____, Fair_ X _, Good_ X, X, X, X, X, X, X, X, X, X, X _, Excellent_ X, X _.

- ***Town of Farmington:*** This would be the same with any provider we have found. In emergencies the County goes out of their way to help and get a problem fixed.

6. What services does your city/township/village contract out to private sources?
Road Maintenance_X, X, X, X, X, X__, Winter Maintenance_X__, Culvert Repair__X, X, X, X, X__, Brushing_X, X, X, X, X__, Road Reconstruction__X, X, X, X, X, X, X, X, X, X__, Other

- ***Town of Cold Spring:*** None.
- ***Town of Farmington:*** Maintenance mainly sealcoating. Culvert repair was only on a road that was completely cleaned up right of way to right of way including all driveway culverts. Brushing outsourced to a company with a one machine operation.
- ***Town of Lake Mills:*** Depends on the bidding process.
- ***Town of Palmyra:*** Some brushing is contracted out.
- ***City of Fort Atkinson:*** City forces do road and winter maintenance, small culvert repairs/replacements and small road reconstruction projects. Large/deep culvert repairs/replacements and large road reconstruction projects are contracted out.
- ***City of Lake Mills:*** Milling, Paving, Aggregate Supply.
- ***City of Waterloo:*** Sanitary sewer televising; Manhole replacement or reconstruction; Some tree trimming.
- ***City of Whitewater:*** Seal Coating.

7. What is the level of satisfaction of those services provided by private contractors to your city/township/village?

Poor____, Fair____, Good_X, X, X, X, X, X, X, X, X, X___, Excellent__X, X, X__,
Not Applicable__X__.

8. Please list the name(s) of private contractors providing services to your township/village.

Town of Cold Spring:
None
Town of Farmington:
Angelica Tile, Inc.
Wolf Paving
BR Ammon & Sons
Christoph Excavating
Brechler Construction (out of business)
Fahrner Asphalt Sealers Inc.
Scott Const.
Gallitz Grading Inc.

Town of Hebron:
Wolf Construction
2 Guys Trimming
Angelica
Randy Thorman

Town of Lake Mills:
Fahrner
Amon & Sons/Lake Mills Blacktop
Town of Milford:
Weis Excavating
Lake Mills Blacktop/BR Amon & Sons
Also bids accepted by:
Payne & Dolan
Scott Construction
Fahrer Asphalts
Town of Palmyra:
Nature Friendly Landscape
David Tutton
Town of Waterloo:
Glenn Wolff
Kyle & Kurt Skautsky

Village of Palmyra:
Hause Bros. Construction
Odling Construction
B.R. Amon & Sons
Payne & Dolan
Wolf Construction
Struck & Irwin
Fahrer Asphalt
City of Fort Atkinson:
Allen Hokse & Son
Hausz Brothers, Inc.
B.R. Amon & Sons, Inc.
A.B.I.
GMS Excavators, Inc.
Jaeckel Brothers, Inc.

City of Jefferson:
B.R. Amon and Sons
Frank Brothers

City of Lake Mills:
ABI
Hausz Bros
Lake Mills Blacktop (Amon)
Jason Forest

City of Waterloo:
VISU-Sewer Clean & Seal Inc.
B.R. Amon & Sons Inc.
Lake Mills Blacktop Inc.
Struck & Irwin Paving Inc.
Crack Filling Services
Northern Sewer Equipment Co., Inc.

City of Whitewater:
Mann Brothers
Amon Blacktop

9. What is your city/township/village's level of satisfaction for response time (promptness) of services provided by private contractors?

- **Excellent:** (X , X, X, X
- **Good:** (X, X, X, X, X, X, X, X
- **Fair:** (X
- **Poor:** ____
- **Not Applicable:** (X

10. If the County Highway Department were to eliminate or cut back on various services, which service(s) would be most missed by the city/village/township? Please list which services would most be missed and explain any alternative service delivery options (other the County Highway Department) available to your City/township/village

- ***Town of Cold Spring:*** All that are listed above.
- ***Town of Farmington:*** Culvert repair & replacement, sealcoating, road rehabilitation including pulverizing, grading new pavement & overlays, and ditch cleaning along the roadsides. Alternatives: Culverts & ditching - local contractor, but not pavement friendly, metal tracks tear up roads; Sealcoating - outsource from others but have not been real happy with finished product life; Pavement - outsource - companies used in past were lower bid price versus County estimate in some cases only $1,000.
- ***Town of Hebron:*** Winter maintenance; Road maintenance.
- ***Town of Lake Mills:*** Winter maintenance - several other private contractors are available.
- ***Town of Milford:*** Road maintenance/reconstruction - other, higher, bids would have to be accepted.
- ***Town of Oakland:*** Culvert aid program
- ***Town of Palmyra:*** Winter maintenance.
- ***Town of Waterloo:*** Road construction; Bridge aid.
- ***Village of Palmyra:*** Roadside mowing - would probably purchase own equipment and go back to doing it ourselves again. Fuel deliveries - would just go back to having a private co. deliver our fuels again.
- ***City of Fort Atkinson:*** Currently do not use County forces. City is able to do the work with its own forces or secure a private contractor to do the work.
- ***City of Jefferson:*** Chip Seal program we have with Jefferson County is excellent. The chips are coated, lessening dust and the crews are efficient. We no longer use Jefferson County for road reconstruction.
- ***City of Lake Mills:*** Seal coat, Road reconstruction, Pulverizing.
- ***City of Waterloo:*** Snow emergency or winging back snow - we would either have to contract the winging out or purchase a wing for our fleet.